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Impact of Youth Academic-to-Industry Bridging Programs on Gender Sensitive Youth Socio-Economic Empowerment

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Abstract

Student transition from academia to productive and professional workforce remains a critical challenge for youth employment. There exists an ongoing philosophical debate within academia regarding prioritization of lifelong learning over employability skills. This action research-based paper explores the impact of academic-to-industry bridging programs, with a focus on the Cyber Shujaa program. The program aimed to bridge academia-industry gap by providing transitional skills and capacity building that facilitates employment through job placements, entrepreneurship, and career advancement while promoting gender mainstreaming The research answers the question of whether academic to industry bridging programs help their beneficiaries attain meaningful employment and entrepreneurial opportunities. The research was informed by the Theory of Change which hypothesized that the program design features contribute to youth performance which in turn results into youth employment, gender participation and youth confidence, and ultimately influencing youth socio-economic empowerment. The study employed a descriptive correlation research design. The findings indicated that the program had a significant and positive impact on participants' employment readiness and technical skill application. Additionally, gender analysis revealed no statistically significant difference in employment outcomes, suggesting that the program's gender mainstreaming approach successfully supported equitable career development. However, moderate satisfaction with employment preparation and placement suggested areas where enhancements could be made. Participants also reported a strong sense of purpose in pursuing cybersecurity careers, which positively correlated with their confidence levels. These findings underscored the importance of combining robust technical training with industry-based purpose-driven program components to enhance professional confidence, employability, and overall career satisfaction. This paper contributes to the ongoing dialogue on how to better equip young graduates for the demands of the industry, ultimately fostering a more inclusive, confident, and effective workforce.

Keywords: *Cybersecurity, Entrepreneurship, Gender Disparity, Impact, Youth Unemployment.*

Introduction

This action research-based paper investigates the impact of youth academia-industry bridging programs on gender sensitive youth socio-economic empowerment. Specifically, the research aims to evaluate the impact of youth academia-industry bridging (intervention) programs on youth employment and business opportunities; analyze the effect of gender mainstreaming in youth academia-industry bridging programs on gender participation outcomes; and assess the socio-psychological implications of youth academia-industry bridging programs on the youth behavior. The research used descriptive correlation research design. The study population constituted 583 graduating or recent ICT youth graduates from 82 tertiary institutions in Kenya and over a dozen from other countries including Uganda, Ethiopia, United States, United Kingdome, Australia, India, Russia and others not specified. Hence, the conveniently self-selected sample population consists of 297 participants in the Cyber Shujaa academia-industry bridging program in Kenya. The research analysis includes application of descriptive statistics to assess the level of respective measurement indicators as well as correlation analysis linking respective program design features to key outcomes in the form of employment and entrepreneurship, gender participation, and youth confidence. The research approach is informed by the Theory of Change (ToC) where it is hypothesized that the program design features (activities) contribute to youth performance (outputs) which in turn results into youth employment, gender participation and youth confidence (outcomes) and ultimately having an influence of socio-economic empowerment on youth behavior (impact).

Table 1

ToC Matrix

Activities (Inputs/Interventions)	Outputs (Measurement Indicators)	Outcomes	Impact
Respective program design features (Recruitment, curriculum, training and mentorship, resources, placement)	Conversion rate, conversion speed, gender split, higher wage, career advances, contracts, business creations, innovations, savings on social programs, savings on unemployment benefits,	Employment and Entrepreneurship Level	Socio-Economic Empowerment
Respective program design features (Recruitment, curriculum, training and mentorship, resources, placement)	a) cross-tabulation of all the above, and b) access education or training, access credit, share of domestic responsibilities, independence, control own lives, certifications	Gender Participation Rate	
		Confidence Level	

]Respective program design features (Recruitment, curriculum, training and mentorship, resources, placement)	Self-confidence, business abilities confidence, meaningful employment confidence, employment prospects, positive attitude, in control, no alcoholism, no drug abuse, no criminal activity,

Statement of the Problem

Despite various interventions aimed at empowering youth in Kenya, significant disparities remain in terms of employment opportunities and gender participation, specifically in the field of cybersecurity where Kenya faces a substantial skills gap that hinders the country's ability to fully leverage the digital economy. Programs like Cyber Shujaa aim to bridge this gap by providing the youth with relevant skills along with employment and entrepreneurship opportunities in the cybersecurity field. Existing data indicate that young women often face greater barriers to employment and entrepreneurship compared to their male counterparts. Moreover, while academic-industry bridging programs are becoming increasingly popular, there is limited empirical evidence on their effectiveness in addressing these gender disparities and their overall impact on youth socio-economic empowerment. This action research seeks to fill this gap by critically evaluating the influence of these programs on youth employment and business opportunities, gender participation outcomes, and behavioral outcomes such as confidence and self-reliance.

Objective

The general objective of this research is to evaluate the impact of youth academia-industry bridging (intervention) programs on gender-sensitive socio-economic empowerment for young people, i.e., to evaluate the impact of youth academia-industry bridging programs in enhancing employment and business opportunities; assess the Impact of a Cyber Shujaa youth employment program has had on gender sensitive socio-economic empowerment; and assess the socio-psychological effects of participation in these programs on youth behavior, focusing on confidence levels, substance abuse, and overall attitudes towards employment.

Literature Review

The aim of the Cyber Shujaa youth employment and entrepreneurship program is to address the challenges and barriers faced by young people in the cybersecurity industry in Kenya in accessing decent and productive work opportunities (DAPWO), inclusive of employment and entrepreneurship. The persistence of labor market imbalances has led to the concern that unemployment is becoming more structural in nature, with greater worry in the increase of youth who have withdrawn from the workforce, and those who are neither in employment nor education (ILO,2012). As a result, many countries have implemented youth employment programs aiming to promote economic inclusion, skills development, job placement, entrepreneurship support, and career guidance and counseling. The question then is: do these programs work in helping their beneficiaries find quality jobs or establish enterprises to

improve their quality of life. The aim of this section is to explore this question by reviewing literature on youth employment/training and entrepreneurship programs as well as related experiences.

Impact of youth academic-industry bridging programs on youth employment and entrepreneurship

Many governments have introduced welfare schemes to support the unemployed and vulnerable in society, since youth unemployment places a burden on public finances through increased social welfare costs. A study by (Oreopoulos et al. 2008) in Canada found that participation in targeted employment programs for disadvantaged youth not only improved

employment outcomes but also reduced reliance on social assistance programs. This increases chances of youth employment, and more disposable income and more spending. This increased spending can have a multiplier effect, driving economic growth

General Programs: In Nepal, a variety of private and public technical and vocational training (TEVT) programs have been made available to the youth to address concerns about the social exclusion of women, ethnic minorities, indigenous people and other disadvantaged groups (Chakravarty et al., 2016). In 2009, the Employment Fund (EF) launched the Adolescent Girls Employment Initiative (AGEI) in partnership with the world bank to specifically reach Nepali women aged 16-24 over a three-year period. After the three-year period, impact measurements showed that the EF program had reached over 40,000 youth, with the AGEI having contributed by reaching 4,410 women aged 16-24. The EF intervention positively improved youth employment outcomes with an increase of 16 to 17 percentage points in non-farm employment and an overall gain of 47 percent. The program also generated an average monthly earnings gain by about 45 percent for the 2010 cohort.

In Kenya, the Kenya Private sector Alliance and the Government of Kenya with support from the World Bank's Kenya Youth Empowerment Project piloted an internship program in Nairobi, Mombasa and Kisumu with the aim of improving employment outcomes for the youth. According to (Honorati, 2015) the program offered job-relevant technical skills and life skills as well as entrepreneurship training. Impact evaluation on the second cohort showed that the combination of skills training and hands-on experience in private sector firms increased the chances of unemployed youth being retained at the end of their internship. The certificate offered after the completion of training was also seen to influence the employment chances of the trainees as it acted as a signal to employers that these young people possessed certain sector-specific and core business skills. In addition to this, the program was also able to record a 15 percent increase in employment in Men and a wage increase of about KES 7500 for women.

However, in contrast with a similar program in Turkey, their vocational training program showed small and insignificant positive impact on employment and working hours. In addition, it was noted that employment gotten at the end of the program was not permanent and within a year's time, there was no significant difference between those who took and those who didn't take the training. Nonetheless, it was also noted that the program did have an effect on the job quality, with those who participated in the program getting formal jobs and benefitting in incomes earned from this, and having higher socioeconomic occupational status (Hirshleifer et al., 2015).

With respect to the European experience, the Card et al. (2009) analysis suggested that while training programs were not particularly effective in the short-run, they had a larger positive impact between 1-2 years after the program. This can be attributed to the impact that time has on work experience and professional growth, with many beneficiaries who secured internships after completion of training programs, later own moving up the corporate ladder. But, according to Cappellini et al., (2019), the Italian traineeships were in fact found to hinder rapid

transition to work. These programs were also found to be detrimental for youth who were willing to take any job regardless of quality or fit. Nonetheless, they served as effective stepping-stones for career development, with a 7-percentage point benefit estimated on the probability of finding quality jobs after completion of the program. In addition, the same study in Tuscany showed an 8-percentage point increase in employment 18 months after the start of the program. In Friuli Venezia Giulia, the evaluation results indicated an increase in employment probabilities by about 5%, at least 1 year from the end of the program. In Umbria, the study on graduate traineeships done 1 or 2 years after the program showed that participants were more likely to be employed, and access apprenticeship contracts compared to similar graduates who didn't participate. These studies show that despite delayed effects, the impact on employability of youth employment participants increases with time, where a significant increase is felt at least a year after the completion of the program.

***Sector Specific Programs*:** The theory of change states that change is only possible when program interventions are matched with youth constraints (Kluve et al., 2016). With that in mind, programs that have been tailored to address sector specific needs and skills gaps have been seen to have greater success in job placements as there is a ready market. With the global economy growing more dependent on computer networks as an economic engine, cybersecurity has become an increasing concern for most organizations and governments. Numerous factors have led to the increasing cybersecurity skills gap which is only expected to grow with time (Vogel, 2016). In Kenya, public and private organizations have sought to solve this skills gap by creating cybersecurity and information technology training programs to equip the youth with the necessary skills to meet the growing need for cybersecurity professionals. Some of these training programs include: Kamilimu, Ajira Digital, Africahackon, SheHacks, ALX among others.

Elsewhere, Betcherman, Olivas, and Dar's (2004) comprehensive review that evaluated Active Labor Market Programs (ALMPs), focusing on their impact in developing and transition countries, found that ALMPs have mixed results. The study found that programs providing skills-based training often show positive results, though mainly in the short term and primarily in developed economies. However, in developing and transition countries, the impact is often less significant. For youth and disadvantaged groups, training programs tend to yield limited long-term benefits, frequently failing to lead to stable, high-quality employment. Subsidized employment and public works programs show better immediate placement results but have limited sustained impact once program support is removed (Betcherman, Olivas, & Dar, 2004).

This review underscores that program effectiveness requires strong alignment with labor market demand, sector tailored implementation, and robust evaluation to achieve sustainable results. Therefore, tis literature shows the importance of considering local economic conditions, participant needs, and sustainability issues when designing academic-industry bridging programs.

Entrepreneurial Opportunities: According to Eisenmann (2013), entrepreneurship is defined as the creation of new ventures that aim to offer innovative products or services while assuming financial and personal risks. An entrepreneur can be defined as someone who creates a new business amid risk and uncertainty to achieve profit and growth by identifying significant opportunities and assembling the necessary resources (Scarborough and Cornwall, 2016). According to Psilos and Galloway (2018), youth entrepreneurship programs that integrate core skill development, such as opportunity recognition and resource mobilization, alongside complementary services like mentorship and financial support, are shown to increase employability and business performance outcomes.

The results of a USIU-Africa study (Wambalaba, 2020) by the Global Agribusiness Management and Entrepreneurship (GAME) Center with respect to youth entrepreneurship resilience against COVID 19 showed that while the pandemic reduced sales and incomes and

forced business closures, 366 out of 500 respondents (73%) were still in business by end of 2020 (or 28% female), and only dropping to 260, (52%) in 2021. The study found that spending time networking, seeking advice and funds, using of social media, and diversification boosted sales.

Green (2013) highlighted the pressing issue of youth unemployment and found that enterprise education positively influences youth entrepreneurial intentions. However, it remains uncertain how effective these programs are in converting entrepreneurial intentions into actual enterprises. This uncertainty is largely due to the likelihood that the effects of such education may only manifest when individuals enter self-employment, often after the age of 30 (Green, 2013.).

According to Kluve et al, (2019), youth employment interventions can be grouped into four main categories: (i) training and skills development, (ii) entrepreneurship promotion, (iii) employment services, and (iv) subsidized employment. An analysis done of 113 primary studies encompassing over 3,500 treatment effects highlighted that while many youth employment programs yield positive labor market outcomes, impact levels vary significantly by intervention type. Thus, entrepreneurship promotion programs, for instance, demonstrated an aggregate effect size more than twice that of skills training programs (0.12 compared to 0.05), suggesting stronger impact in self-employment contexts. The study also found that multi-component programs addressing various constraints tend to be more effective. Programs incorporating beneficiary profiling, follow-up engagement, and performance-based incentives for service providers achieved higher success rates. These design features enable programs to be more responsive to participants' needs.

In Kenya, the Presidential Digital Talent program (PDTP) is one of the Kenyan government's youth programs that combines both public and private partnership to promote innovation skills development, on the job training and mentorship. The program offers a 12-month internship period to recent graduates. According to Macharia, J. (2019) at the time, the PDTP program had received 142 innovation proposals from the program beneficiaries, with 50 of these innovations targeting the improvement of public sector institutions. Seven of the submitted ideas were implemented by the target public institutions, where the Agriculture Management System aided the institutions providing a central shareable database and providing real time reports, while the Blood Service Information Management System improved the inventory of the hospital's blood bank by reducing the cases of expired blood, Thus, investing in youth talent programs is a strategic move for long-term economic resilience and entrepreneurship.

This literature reveals that targeted youth talent programs, especially those promoting entrepreneurship and addressing multiple constraints, have the potential to positively impact youth labor market outcomes. However, success is often context-dependent, emphasizing the importance of intervention design and contextual adaptation in program implementation.

Effect of gender mainstreaming in youth academic-industry bridging programs on gender participation outcomes

According to Woodruff, T., (n.d.), only 30% of academic professionals in Africa are women, in sub-Saharan Africa, women make up only 30% of the research workforce, and that it will take an estimated 131 years to close the global gender gap at the current pace of change. She argues that in the United States, women make up over 50% of life sciences doctorate earners but account for only 26% of full professors, women received $25,000 less than their male counterparts in their first NIH grants, and in Nigeria, there are just 1,800 female faculty members out of a total of 11,877 professors. She suggests three principles essential to advancing gender equality and ensuring a more sustainable future for global science, i.e., visibility, viability, and value.

The cybersecurity industry is no exception to the disparity between men and women when it comes to job access, career advancement, entrepreneurship and pay scales. Thus, cybersecurity as well as other information technology professions are viewed as a man's job despite the perception that anyone with the right skills, knowledge and experience can work in any field (Peacock & Irons, 2017). Hence, the low representation of women in various industries and professions has been a subject of concern and research for quite some time. Therefore, gender sensitive youth empowerment programs then play a critical role in narrowing this divide by offering equal access to skills development and training, career guidance and mentorship, promoting entrepreneurship and by providing advocacy and awareness.

According to Korkoyah and Tasneem, (2014), the unemployment rate of women in Liberia was significantly high because they had fewer opportunities for education or training, less access to credit, a larger share of domestic responsibilities, less independence and control over their own lives. To combat this, the government of Liberia implemented an Economic Empowerment of Adolescent Girls and Young Women (EPAG) program in 2010 that combined six months of classroom based technical and life skills training, followed by six months of follow-up support to enter wage employment or start a business. The program also provided saving assistance for each participant; the midline survey indicated that the treatment group were nearly 50 percentage points more likely to have savings than the control group, and were saving on average LD 2500 more than the control group. In addition, EPAG graduates were twice as likely to obtain formal loans than the control group.

As part of the impact review of the EF program in Nepal, gender-disaggregated impact showed that the program had a greater impact on women, with outcomes showing that the program was more effective in getting women into desired employment and increasing their earnings above the 3000 NRs per month than it did for men. However, the larger impact on women than men was attributed to the fact that men started with a higher level of non-farm employment of 47% compared to 20% for women at baseline. Thus, women selected for training in 2010 to 2012 experienced overall and non-farm employment gains of 13 and 19 percentage points respectively, while the corresponding impact for men were 2 and 10 percent. The AGEI program detected almost no statistically significant differences between younger women aged 15-24 and older women aged 25-35. The only notable difference was in employment, with young women seeing larger gains on obtaining work outside the home than older women.

In Africa, some programs have sought to narrow the ever-growing cybersecurity skills gap by promoting and supporting the inclusion of women in the male dominated field. The SheHacks program in Kenya is one such program. Since 2016 the program has held and participated in over 150 conferences or webinars, providing insight on the cybersecurity industry as well as skills training on different cybersecurity areas. SheHacks has over 400 active members and 40 student clubs and has partnered with companies such as Microsoft, Safaricom, AfricaHackon and Strathmore University to inspire, engage and empower young women to take up positions in the cybersecurity industry (Shehacks, n.d.)[1]. Similarly, Cybergirls is a cybersecurity fellowship that offers free 7 months training for young women aged 18-28 years old, equipping them with globally sought after cybersecurity skills. Their learning paths include: cloud security, critical infrastructure security, DevSecops, incident response among others. The

[1] https://Www.shehackske.com/

program has been able to reach 22 African countries and has 65% of its alumni employed *CyberGirls – CyberSafe Foundation – Website* (n.d.)[2].

Similarly, the Kenya Private Sector Alliance. the Kenya government, with support from the World Bank's Kenya Youth Empowerment Project offered job-relevant technical skills and life skills as well as entrepreneurship training. The program recorded a 15 percent increase in employment in Men and a wage increase of about KES 7500 for women. And in a gender mainstreaming study on resilience against VOVID 19, Wambalaba (2020) showed that 28% of the female businesses were still in business by end of 2020. The study argued that the entrepreneurs who survived the pandemic shock spent more time networking, seeking advice and funds, made greater use of social media to boost sales, and diversified their business, measures which were reinforced by training offered by the GAME Center (Wambalaba, 2020).

These instances show that training programs have had a significant impact on gender by providing an equal platform for both genders. The programs foster a sense of community providing a place to network and provide peer mentorship.

Socio-psychological implications of youth academic-industry bridging programs on the youth

According to Kalei, (2015), the prevalence of joblessness among educated youth has become a cause of frustration especially when graduates enter the job market only to realize they lack the required job skills. Youth employment programs have had significant social implications in different areas such as improving mental wellbeing of participants. Bridging programs not only address employability but also fulfill socio-psychological needs. The Self-determination Theory suggests that environments fostering autonomy and competence—characteristics of many youth entrepreneurship programs—lead to increased motivation and well-being (Ryan & Deci, 2000). Additionally, these programs mitigate the sense of uncertainty and insecurity linked with youth unemployment, offering structured paths that improve self-efficacy and resilience. Through these pathways, academic-industry programs act as protective factors, contributing positively to the psychological well-being of young people.

Youth academic-industry bridging programs address youth unemployment's socio-psychological impact by providing resources, skill-building, and pathways into the workforce. Research shows that unemployment often decreases happiness, increases health issues, and can lead to workers losing their skills, causing loss of human capital (Bell & Blanchflower, 2009). Extended youth unemployment has scarring effects, such as poorer future wages and a higher likelihood of prolonged unemployment (Blanchflower & Oswald, 1998). Additionally, the economic impact of youth unemployment includes societal costs, with EU estimates placing the annual cost of youth Not in Employment, Education, or Training (NEETs) at €101 billion (Eurofound, 2011).

Therefore, youth academic-industry bridging programs into the workforce—play a significant role in alleviating these challenges by reducing social isolation, fostering a sense of purpose, and enhancing self-efficacy. Evidence suggests that entrepreneurial activities, as fostered by bridging programs, deepen human capital through self-reliance and skill development, and increase levels of happiness among young people (Blanchflower & Oswald, 1998).

[2] https://cybergirls.cybersafefoundation.org/

Furthermore, bridging programs that provide targeted support can help reduce the "scarring effects" of youth unemployment, equipping young people with practical skills and market knowledge that foster psychological resilience and greater employability (Francis Green, 2013).

A follow up survey of the beneficiaries of the Turkish vocational training showed that the program improved mental well-being by leading individuals to think that their future employment prospects will be better even if there wasn't immediate change. The survey showed that 54.1% of the participants expected to be meaningfully employed in two years' time. A similar study in Norway by Hardoy, (2005) states that youth employment programs countered the negative effects of unemployment such as alcoholism, drug abuse and criminal activity by reversing social exclusion/ labor market marginality. Participation in these programs provided a sense of purpose and contributed to participants' overall well-being. In Liberia, the EPAG graduates reported a more positive attitude: they felt more in control and more comfortable, and they had a greater confidence in their own business abilities as well as in their personal and social lives. They were also more confident than the control group in their personal relationships with spouses and partners.

However, while employment can have positive effects on mental health, it can also contribute to stress and burnout, particularly if the job is stressful or the work environment is hostile. Youth employment programs should consider factors like workload, workplace culture and job security when placing their beneficiaries in different companies to mitigate negative mental health. A study by Houle et al, (2015) in Canada found that young adults who struggled with this had had high levels of psychological distress. Youth employment programs should offer transition support and career counseling even after placing their beneficiaries to help them navigate the phase smoothly.

The implications of youth employment programs on mental health are nuanced, with both positive and negative aspects to consider. While employment can enhance self-esteem, provide social support, and reduce mental health disparities, it can also lead to stress and burnout, particularly in demanding work environments. More research is needed to better understand the complexities of this relationship and to inform the development of evidence-based youth employment programs that promote positive mental health outcomes.

Research Methodology

This study employed a mixed-method approach, enabling the integration of both qualitative and quantitative data to provide a comprehensive analysis. Data collection was conducted using structured questionnaires, which were distributed to two distinct cohorts within the Cyber Shujaa Program in 2024. Each cohort participated in a three-month training program in one of two specialized tracks: the Security Analyst track or the Cloud and Network track. Both tracks included complimentary soft skills training. The study population comprised of 583 Cyber Shujaa students enrolled in cybersecurity training, and responses were received from 297 participants, resulting in a response rate of 50.9%.

Results and Findings

Impact of youth academic-industry bridging programs on employment opportunities

The purpose of this analysis was to assess the impact of the Cyber Shujaa program on the employment readiness of its participants. The study aimed to evaluate participants' perceptions of their skill application in real-world job settings, satisfaction with the technical skills acquired, perceived effectiveness of the program in preparing participants for employment, and satisfaction with placement support services.

Descriptive Statistics

The analysis used a 5-point Likert scale to measure participants' responses to various items, where: 1 = Not at all, 2 = Slightly, 3 = Moderately, 4 = Considerably, and 5 = Very much. This scale allowed participants to indicate the extent to which they agreed with or experienced each statement, with higher scores reflecting a greater degree of agreement or experience.

The descriptive statistics revealed several key insights into the impact of the Cyber Shujaa program on participants' employment readiness. The mean score for the item "To what extent have you applied your skills to real-world job opportunities?" was 4.35 (SD = 0.67), suggesting that participants felt they could or were effectively applying their acquired skills in real-world job contexts. Satisfaction with the proficiency of technical skills gained was also high, with a mean score of 4.44 (SD = 0.67), indicating that most participants were satisfied with their technical training. However, when evaluating the program's preparation for decent employment, the mean score was 3.83 (SD = 1.06), indicating moderate satisfaction and a greater variance in responses. This suggests that while many felt prepared, others may have had reservations regarding the program's ability to adequately prepare them for the workforce.

Furthermore, the mean score for satisfaction with the placement assistance provided by the program was 3.08 (SD = 1.38), indicating a more moderate level of satisfaction with the support in securing employment. The higher standard deviation in this category points to substantial variability in participants' experiences with placement services, suggesting that improvements in this area could enhance overall program effectiveness. In general, therefore, apart from the perception of the program performing moderately above average with respect to job placement, it was perceived to be fairly good in preparing participants for decent jobs, considerably successful in preparing them for proficiency in their technical skills and real life employment skills.

Correlation Analysis

To examine the relationships between participants' skill application in professional settings and their satisfaction with technical proficiency, a correlation analysis was conducted using a 2-tailed test. This approach allows for the detection of significant associations in either direction (positive or negative) without assuming a predefined relationship. The analysis explored whether higher levels of technical proficiency corresponded with increased satisfaction in real-world skill application, thus assessing the program's effectiveness in equipping participants with employable skills.

Table 2

Correlation Between Real-World Skill Application and Satisfaction with Technical Proficiency

		Extent of applied skills to real-world job opportunities	Satisfaction with proficiency of technical skills gained
Extent of applied skills to real-world job opportunities	Pearson Correlation	1	0.64
	Sig. (2-tailed)		9.7793E-36
	N	297	297
Satisfaction with proficiency of technical skills gained	Pearson Correlation	0.64	1
	Sig. (2-tailed)	9.7793E-36	
	N	297	297

**. Correlation is significant at the 0.01 level (2-tailed).

The analysis indicated a strong, positive correlation between these variables ($r = 0.64$, $p < 0.01$), suggesting that participants who reported higher levels of skill application in real-world contexts also expressed greater satisfaction with their technical proficiency.

The significance level ($p = 0.000$) indicates that this correlation is statistically significant at the 0.01 level, reinforcing the robustness of this relationship. These findings imply that the Cyber Shujaa Program may be effective in enhancing participants' technical skills, and thus enabling them to feel confident in applying these skills within professional environments.

Effect of gender mainstreaming in youth academic-industry bridging programs on gender participation outcomes

This analysis focused on two key areas of the project, i.e., current employment status and preparation for decent employment.

With respect to the relationship between gender and current employment status, a cross-tabulation analysis was conducted to examine the relationship between gender and current employment status among 297 participants (30% female). The results indicate that of the total participants, 45.8% reported being currently employed, while 54.2% reported not being employed. Among male participants (n = 208), 44.2% reported being employed, and 55.8% not employed compared to female participants (n = 89), 49.4% were employed, and 50.6% were not. Although the total number of male participants was over twice that of female participants, the proportion of employed individuals was similar across genders, with females showing a slightly higher employment rate. This suggests that while gender is a major concern against entry into the program, it may not be a significant factor in determining employment status within this sample, hence implying the need to focus on gender sensitive recruitment efforts.

Table 3

Crosstabulation Table Showing the Relationship Between Gender and Current Employment Status

		Are you Currently working?		Total
		Yes	No	
Gender	Male	92	116	208
	Female	44	45	89
Total		136	161	297

Similarly, a logistic regression analysis conducted to examine whether gender significantly predicts employment status demonstrated that gender was not a statistically significant predictor of employment status, B = -0.209, SE = 0.254, Wald $\chi^2(1) = 0.680$, p = .410, Exp(B) = 0.811, 95% CI [0.493, 1.334]. This indicates that gender does not significantly influence the likelihood of being employed once in this program. The odds ratio (Exp(B) = 0.81) suggests that, if gender had been a significant predictor, females would have approximately 0.81 times the odds of being employed compared to males. However, given the lack of statistical significance, this effect is not practically meaningful in this context. The confidence interval for the odds ratio [0.49, 1.3] includes 1.0, further confirming that the effect of gender on employment status is not statistically significant in this sample.

Table 4

Equation Variables

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 1a	Gender	-0.21	0.25	0.68	1.00	0.41	0.81	0.49	1.33
	Constant	0.44	0.35	1.58	1.00	0.21	1.55		

In terms of the relationship between gender and perceptions of how well the Cyber Shujaa program prepared participants for decent employment, a cross tabulation was conducted to examine this relationship. The results indicated that both male and female participants generally felt positively about the program's ability to prepare them for employment in the cybersecurity field. Among the 208 male participants, the majority (69.2%) reported that the program prepared them "Considerably," or "Very much" for decent employment in cybersecurity and only 5% males felt "Not at all" prepared. For the 89 female participants, the distribution was similar, with 68.5% females feeling "Considerably" or "Very much" prepared for decent employment in cybersecurity, and only 2% females felt "Not at all" prepared. Overall, the distribution of responses showed that both genders felt largely positive about their preparation, with males reporting slightly higher levels of feeling "Considerably" and "Very

much" prepared compared to females. However, males also had a higher level of responses in the "Not at all" prepared categories (5%) compared to females (2%).

Table 5

Crosstabulation of Biological Sex and Perceived Preparedness for Employment in Cybersecurity

	How well do you believe the Cyber Shujaa program prepared you for decent employment in cybersecurity?					Total
	Not at all	Slightly	Moderately	Considerably	Very much	
Male	10	15	39	78	66	208
Female	2	6	20	40	21	89
Total	12	21	59	118	87	297

Socio-psychological implications of youth academic-industry bridging programs on the youth

To assess the socio-psychological implications of youth academic-industry bridging programs on the youth, a descriptive statistics analysis was carried out. Further, a correlation analysis was conducted to assess the relationship between participants' sense of purpose in pursuing a career in cybersecurity and their confidence in communicating their unique value to potential employers.

The descriptive statistics were used to examine participants' perceptions of their career fulfillment, satisfaction with program alignment, and the impact of soft skills training. This analysis aimed to provide an overview of participants' experiences with the Cyber Shujaa program, focusing on their sense of purpose in pursuing a cybersecurity career, the alignment of their career goals with the program's objectives, and the effects of soft skills training on emotional intelligence and coping abilities.

The results revealed that participants expressed a strong sense of purpose and fulfillment in pursuing a career in cybersecurity, with a mean score of 4.63 (SD = 0.58). Satisfaction with the alignment of career goals to the program's objectives was also high, with a mean score of 4.49 (SD = 0.62). Additionally, participants reported moderate to significant improvements in emotional intelligence and their ability to manage life's challenges through soft skills training, with a mean score of 4.27 (SD = 0.68), although there was more variability in these responses. These findings indicate that the Cyber Shujaa program effectively supports both professional development and a feeling of personal achievement for its participants.

Similarly, a Pearson correlation analysis was conducted to assess the relationship between participants' sense of purpose in pursuing a career in cybersecurity and their confidence in communicating their unique value to potential employers. The results indicated a statistically significant moderate positive correlation between sense of purpose and confidence ($r = .40$, $p < .001$), suggesting that participants who reported a stronger sense of purpose also tended to feel more confident in articulating their value to employers. This finding implies that fostering a sense of purpose within the program may be associated with increased confidence among participants in their professional self-presentation.

Table 6

Sense of Purpose

		Sense of purpose and fulfillment in pursuing cybersecurity career?	Confidence in ability to communicate unique value to potential employers
Sense of purpose and fulfillment in pursuing cybersecurity career?	Pearson Correlation	1	0.40
	Sig. (2-tailed)		7.21E-13
	N	297	297
Confident in ability to communicate unique value to potential employers	Pearson Correlation	0.40	1
	Sig. (2-tailed)	7.21E-13	
	N	297	297

**. Correlation is significant at the 0.01 level (2-tailed).

Discussion of Results

This research paper aimed at evaluating the impact of youth academia-industry bridging programs on gender-sensitive socio-economic empowerment for young people, especially with respect to enhancing employment and business opportunities, gender sensitive socio-economic empowerment, and on youth behavioral confidence.

Enhancing Employment and Business Opportunities

The research results indicate that the Cyber Shujaa program has had a positive impact on participants' employment readiness, technical skill satisfaction, and overall career development within the cybersecurity space. Participants reported high satisfaction with the technical skills they acquired (M = 4.44, SD = 0.67) and felt confident in applying these skills in real-world job settings (M = 4.35, SD = 0.67), suggesting that the program effectively equipped them with the competencies necessary for success in the cybersecurity field. These findings align with studies such as Honorati (2015), which highlighted the success of Kenya's internship program in enhancing employability through job-relevant technical skills training, and Card et al. (2009), who demonstrated the positive medium-term impact of technical training programs in Europe, where participants experienced career growth through internships and skill application. These studies reinforce the idea that strong technical skills significantly contribute to employment outcomes, particularly in skill-intensive fields like cybersecurity. However, while the program demonstrated strong technical training outcomes, areas for improvement emerged in the realms of job preparation and placement support services. The moderate satisfaction with the program's preparation for decent employment, reflected in a mean score of 3.83, suggests that some participants felt the program did not fully prepare them for the broader challenges of securing a job in cybersecurity. Additionally, the findings revealed a notable gap in satisfaction

with placement support services, which scored a mean of 3.08. This indicates that the assistance provided in securing employment fell short of many participants' expectations. This result is consistent with research by Chisholm (2017) and the International Labour Organization (2020), which highlights the challenges training programs face in delivering effective job placement services, particularly in competitive, fast-evolving sectors like cybersecurity. Contrasting evidence, such as Hirshleifer et al. (2015) in Turkey, suggests that the effectiveness of training programs may vary significantly depending on context and program design. Their study found only small and insignificant impacts on employment, with no lasting differences between participants and non-participants after a year. This underscores the importance of considering local factors and tailoring program designs to better meet the needs of participants in specific contexts.

The correlation analysis further strengthens the understanding of the program's effectiveness, revealing a strong positive relationship between participants' satisfaction with their technical proficiency and their ability to apply those skills in real-world job contexts ($r = 0.64$, $p < 0.01$). This result is in line with previous studies that emphasize the importance of practical application in enhancing participants' confidence and employability (Vo et al., 2019). However, the analysis also suggests that while technical proficiency is crucial for employment success, it is not the sole determinant. The moderate satisfaction with placement support highlights the need for additional career-oriented services to help participants bridge the gap between training and employment

Gender Sensitive Socio-economic Empowerment

Although the total number of male participants in the Cyber Shujaa program was over twice that of female participants, the proportion of the employed was similar across genders, with females showing a slightly higher employment rate. This suggests that while gender is a major concern against entry into the program, it may not be a significant factor in determining employment. When gauging the effectiveness of the program in addressing gender disparities, the findings of this study demonstrate that gender does not significantly influence employment outcomes among participants in the Cyber Shujaa program. Logistic regression analysis showed no statistically significant relationship between gender and employment status ($B = -0.209$, $p = .410$, $Exp(B) = 0.811$, 95% CI [0.493, 1.334]), with similar proportions of male and female participants being employed. These results align with research on gender-targeted initiatives like Liberia's EPAG program, which successfully increased women's employment rates by providing tailored skills training (Korkoyah & Tasneem, 2014). Similarly, Nepal's AGEI program reported notable employment gains for women compared to men, further emphasizing the importance of such programs in addressing gender disparities (World Bank, 2013). In addition to employment outcomes, both male and female participants in this study expressed largely positive perceptions of how well the program prepared them for employment, with 69.2% of males and 68.5% of females reporting feeling "Considerably" or "Very much" prepared. These results echo the objectives of programs like SheHacks Kenya and CyberGirls, which focus on equipping women with skills and mentorship to thrive in the cybersecurity field (SheHacks, n.d.; CyberSafe Foundation, n.d.). However, while the findings highlight the program's success in fostering gender equality in employment, they do not account for potential wage disparities, an issue noted by Woodruff (n.d.), who observed systemic inequities in pay and career advancement for women globally. Addressing this gap in future research could provide a more comprehensive understanding of the program's impact on gender equality.

Youth Behavioral Confidence

Lastly, the findings from this study highlight the socio-psychological implications of youth academic-industry bridging programs, particularly in fostering participants' sense of purpose, professional confidence, and emotional resilience. Participants expressed a strong sense of purpose and fulfillment in pursuing a career in cybersecurity ($M = 4.63$, $SD = 0.58$), which aligns with Self-Determination Theory (Ryan & Deci, 2000). This theory posits that environments fostering autonomy and competence enhance intrinsic motivation and well-being. Similarly, high satisfaction with the alignment of career goals to program objectives ($M = 4.49$, $SD = 0.62$) reinforces the critical role of structured programs in enhancing career satisfaction and providing clear pathways to professional fulfillment (Bell & Blanchflower, 2009). The reported improvements in emotional intelligence and coping abilities from soft skills training ($M = 4.27$, $SD = 0.68$) further corroborate the importance of holistic training approaches. These findings are consistent with Blanchflower and Oswald's (1998) assertion that skill-building programs enhance psychological resilience and self-efficacy. Moreover, they resonate with the outcomes of similar initiatives, such as the Turkish vocational training programs, where participants experienced increased optimism about their future employment prospects despite no immediate changes in employment status (Hardoy, 2005). The significant moderate positive correlation ($r = .40$, $p < .001$) between participants' sense of purpose and their confidence in communicating their unique value to employers underscores the intertwined nature of intrinsic motivation and professional self-efficacy. This finding echoes outcomes from programs like the EPAG initiative in Liberia, where participants reported enhanced confidence in both professional and personal domains following their engagement in structured training programs. Such evidence highlights the importance of fostering a sense of purpose to strengthen participants' confidence in navigating the job market. However, the variability in responses regarding soft skills training ($SD = 0.68$) suggests the need for more tailored approaches to ensure equitable benefits among participants. Additionally, it is important to note that while the findings indicate largely positive socio-psychological outcomes, they also emphasize the need for continuous post-placement support, including transitional assistance and mental health resources. This thinking aligns with research by Houle et al. (2015), which found that young adults transitioning from education to employment may experience psychological distress without adequate support mechanisms.

Conclusion and Recommendation

This action research provides context specific insights about a specific academia-industry bridging program whose outcomes may need further scaling and research to help improve such linkages. The research findings in general indicate that the Cyber Shujaa program had a positive impact on participants' employment readiness, technical skill satisfaction, and overall career development within the cybersecurity space. These reinforce the idea that strong technical skills significantly contribute to employment outcomes, particularly in skill-intensive fields like cybersecurity. However, while the program demonstrated strong technical training outcomes, areas for improvement emerged in the realms of job preparation and placement support services. The moderate satisfaction with the program's preparation for decent employment, reflected a notable gap in satisfaction with placement support services.

The study also revealed a strong positive relationship between participants' satisfaction with their technical proficiency and their ability to apply those skills in real-world job contexts. However, the analysis also suggests that while technical proficiency is crucial for employment success, it is not the sole determinant. Hence, the moderate satisfaction with placement support

highlights the need for additional career-oriented services to help participants bridge the gap between training and employment.

With respect to gender, the findings of this study demonstrate that gender did not significantly influence employment outcomes among participants in the Cyber Shujaa program. This is despite the total number of male participants in the program being over twice that of female participants, the proportion of females employed was slightly higher. This suggests that while gender is a major concern against entry into the program, it may not be a significant factor in determining employment. This is very significant because it means that while the external environment may reflect gender disparities, the design of the program can significantly reduce those disparities. For example, the logistic regression analysis showed no statistically significant relationship between gender and employment status. Similarly, both male and female participants in this study expressed largely positive perceptions of how well the program prepared them for employment. However, while the findings highlight the program's success in fostering gender empowerment in employment, this may not account for potential wage disparities as noted by Woodruff, who observed systemic inequities in pay and career advancement for women globally. Addressing this gap in future research could provide a more comprehensive understanding of the program's impact on gender equality.

Lastly, in terms of youth behavioral confidence, these findings highlight the program's ability to foster participants' sense of purpose, professional confidence, and emotional resilience. Most participants expressed a strong sense of purpose and fulfillment in pursuing a career in cybersecurity, reflective of the Self-Determination Theory which posits that environments fostering autonomy and competence enhance intrinsic motivation and well-being. Also, high satisfaction with the alignment of career goals to program objectives reinforces the critical role of structured programs in enhancing career satisfaction and providing clear pathways to professional fulfillment. In addition, improvements in emotional intelligence and coping abilities from soft skills training further corroborates Bell & Blanchflower's (2009) importance of holistic training approaches. However, the variability in responses regarding soft skills training suggests the need for more tailored approaches to ensure equitable benefits among participants. Additionally, it is important to note that while the findings indicate largely positive socio-psychological outcomes, they also emphasize the need for continuous post-placement support, including transitional assistance and mental health resources which is in line with Houle et al. (2015), who found that young adults transitioning from education to employment may experience psychological distress without adequate support mechanisms.

To enhance academia-industry linkage in the context of youth employment or business opportunities, among other findings therefore, this research recommends for establishment of strong technical skills programs, particularly in skill-intensive fields like cybersecurity, and certainly improvements in placement support services. It is also recommended that the program emphasizes technical proficiency and ability to apply those skills in real-world job contexts, along with career-oriented services to help participants bridge the gap between training and employment

With respect to gender, the research recommends gender mainstreaming in the program, to reduce gender disparities, including affirmative action in the recruitment process, special women's only cohorts, targeted mentorship, and role modeling ensuring a good representation of females as trainers and mentors. This finding suggests that while gender is a major concern against entry into the program, it may not be a significant factor in determining employment, hence implying the need to focus on gender sensitive recruitment, training and support efforts. In addition, even though post-employment income disparities are beyond a specific program's control, it is recommended that post program mentorship, especially through professional

associations, has the potential to enhance gender resilience and possibly implications to income.

Finally, it's recommended that programs develop built-in resilience mechanisms that increase youth behavioral confidence. These include soft skills programs that infuse a strong sense of purpose and fulfillment in pursuing a career plus emotional intelligence and coping abilities; self-paced programs that create an environment fostering autonomy and competence to enhance intrinsic motivation; structured skilling-placement linked programs to provide clear pathways to professional fulfillment; and continuous post-placement support, including transitional assistance and mental health resources such as through professional associations.

Scaling of such programs; continued monitoring, evaluation and implementation of lessons learnt; along with further structured research would enhance our understanding and therefore appropriate interventions to not only enhance academia-industry linkages, but also improve youth economic opportunities and gender empowerment.

References

Bell, D. N., & Blanchflower, D. G. (2009). Youth unemployment: Déjà vu? *IZA Discussion Papers*, No. 4705, Institute for the Study of Labor (IZA).

Blanchflower, D. G., & Oswald, A. J. (1998). What makes an entrepreneur? *Journal of Labor Economics*, *16*(1), 26-60.

Cappellini, L., González-Velosa, C., & Rosas Shady, D. (2019). Vocational training in Latin America: Learning and job outcomes. *Inter-American Development Bank*.

Chakravarty, S., Lundberg, M., Nikolov, P., & Zenker, J. (2016). Vocational training programs and youth labor market outcomes: Evidence from Nepal. *The World Bank Economic Review*, *30*(2), 318-345.

CyberSafe Foundation. (n.d.). CyberGirls – CyberSafe Foundation. Retrieved from https://cybersafefoundation.org

Eurofound. (2011). Youth unemployment and the risk of social exclusion. *European Foundation for the Improvement of Living and Working Conditions*.

Green, F. (2013). Youth entrepreneurship: A potential solution to youth unemployment. *OECD Publishing*.

Hardoy, I. (2005). Impact of Norwegian employment programs for youth: Findings from a follow-up survey. *The Norwegian Labour and Welfare Administration*.

Hirshleifer, S., McKenzie, D., Almeida, R. K., & Ridao-Cano, C. (2015). The impact of vocational training programs on youth employment: Evidence from Turkey. *The World Bank*.

Honorati, M. (2015). The impact of private sector internship and training on youth employment in Kenya. *World Bank Policy Research Working Paper* No. 7401.

Houle, J. N., Staff, J., Mortimer, J. T., Uggen, C., & Blackstone, A. (2015). The impact of the transition to adulthood on the mental health of young adults. *Journal of Health and Social Behavior*, *56*(4), 458-474.

International Labour Organization. (2020). Global employment trends for youth 2020: Technology and the future of jobs. *International Labour Organization*.

Korkoyah, D. T., & Tasneem, A. (2014). The Economic Empowerment of Adolescent Girls and Young Women (EPAG) Project in Liberia: Midline Results Report. *The World Bank*.

Macharia, J. (2019). The Presidential Digital Talent Programme (PDTP): Fostering innovation among Kenya's youth. *Kenya ICT Authority*.

Michigan State University. (n.d.). Gender equality in academia: Closing the gap through visibility, viability, and value. *Michigan State University*.

Oreopoulos, P., von Wachter, T., & Heisz, A. (2008). The short- and long-term career effects of graduating in a recession: Hysteresis and training costs. *American Economic Journal: Applied Economics*, *2*(1), 1-29.

Peacock, L., & Irons, A. (2017). Gender disparity in the cybersecurity workforce: Challenges and opportunities. *Journal of Cybersecurity*, *3*(2), 123-135.

Psilos, P., & Galloway, S. (2018). Entrepreneurship programs for youth: Strategies for increasing employability and business performance. *IDRC*.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68-78.

SheHacks. (n.d.). Empowering women in cybersecurity. Retrieved from https://shehacks.com

Vogel, D. (2016). Closing the cybersecurity skills gap: Challenges and solutions. *Cybersecurity Journal*, *6*(4), 21-35.

Wambalaba, et. al (2020). Gender Sensitive Implications of COVID-19 on Youth Agripreneurship Resilience https://idrc-crdi.ca/en/stories/coping-covid-19-researching-resilience-young-agripreneurs

Woodruff, T., (n.d.). Breaking the Glass Ceiling: Why Women in Science Must be Visible, Viable and Valuable. https://aapbridge.com/AAPBridge/groups/AAPBridge/stories/breaking-the-glass-ceiling-why-women-in-science-must-be-visible-viable-and-valuable

World Bank. (2013). Nepal: Adolescent Girls Employment Initiative (AGEI). *World Bank Report*.