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Can Online Skilling Programs Foster Employment? Evidence from Punjab

Hamna Ahmed[1], Zunia Tirmazee[2] and Rebecca Wu[3]

Abstract

In this study, we evaluate the impact of an online digital skills training program offered by the Punjab Skills Development Fund (PSDF) in collaboration with Coursera, aimed at providing international-standard online learning to its beneficiaries. The analysis focuses on four key questions: (i) How does the online training program impact employment and income generation? (ii) Did the program target vulnerable groups? (iii) Which courses were most effective in improving labor market outcomes? (iv) Should the program be continued in the future? The study combines administrative data from PSDF on 13,493 trainees who enrolled in the program with data from a phone survey of 685 trainees to collect detailed information on post-program outcomes. The findings reveal that transition-to-work rates are 10 percentage points higher amongst trainees who completed the course. Additionally, non-pecuniary benefits are observed, as course completion leads to trainees reporting significantly higher confidence levels and positive changes such as finding new or online jobs, receiving pay raise, completing or starting a degree, and enrolling in other training programs. The top five most effective courses for transition-to-work include Python for Everyone, Financial Accounting, Graphic Design, Developing Android Apps with App Inventor, and Digital Image & Video Processing. A cost-benefit indicates that the program is economically feasible, as average monthly income gains by trainees suggest that the program's cost per completion can be recovered in less than a year.

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Introduction

This paper assesses the impact of an online digital skills training program offered by the Punjab Skills Development Fund (PSDF). The program aims to help vulnerable youth secure sustainable employment and income-generating opportunities. This program is offered in collaboration with Coursera, the largest provider of Massive Open Online Courses (MOOCs), with 124 million subscribers worldwide. This partnership aims to deliver international-standard online learning to its beneficiaries. Eligible candidates enroll in one of the 22 courses hosted on Coursera. These courses are offered online by renowned universities worldwide and cover five streams: IT & software, digital marketing, finance, professional development and entrepreneurship. Trainees must pay an initial enrollment fee of PKR 2,000. After enrollment, they are eligible for a PKR 5,000 stipend and a certificate from the institute offering the course.This paper assesses the impact of an online digital skills training program offered by the Punjab Skills Development Fund (PSDF). The program aims to help vulnerable youth secure sustainable employment and income-generating opportunities. This program is offered in collaboration with Coursera, the largest provider of Massive Open Online Courses (MOOCs), with 124 million subscribers worldwide. This partnership aims to deliver international-standard online learning to its beneficiaries. Eligible candidates enroll in one of the 22 courses hosted on Coursera. These courses are offered online by renowned universities worldwide and cover five streams: IT & software, digital marketing, finance, professional development and entrepreneurship. Trainees must pay an initial enrollment fee of PKR 2,000. After enrollment, they are eligible for a PKR 5,000 stipend and a certificate from the institute offering the course. These are awarded upon successful completion of the course within three months. Since the program began in 2020, three cycles have been completed.

This report evaluates the program by addressing two questions: i) Who are the participants? ii) Are the participants in this digital skills training program finding employment generating income after graduation? To address the first question, the demographic profile of the participants is assessed, focusing on gender, age, education level and the region of origin. To answer the second question, the employment status, earnings and personal development of trainees are assessed by comparing outcomes for trainees who successfully complete the training with those who do not.

The analysis used two data sources: i) administrative data collected by PSDF on 13,493 trainees enrolled in the program, and ii) a phone survey of 685 trainees, from whom detailed data on post-program outcomes were collected. These sources were used because the administrative data provided a demographic profile of past trainees, while the survey data provided information on how trainees were using the skills they learned, allowing for analysis of the program's impact.

Our analysis reveals that transition-to-work rate was 10 percentage points higher amongst trainees who completed the course, and 7 percentage points higher among unemployed trainees who completed the course. trainees who complete the course also reported non-pecuniary benefits including significantly higher confidence levels and positive changes such as finding new or online jobs, receiving pay raises, completing or starting degrees, and participating in other training programs. Analysis by course indicated varying effectiveness, with the top 5 most effective courses for transition-to-work being Python for Everyone, Financial Accounting, Graphic Design, Developing Android Apps with App Inventor, and Digital Image & Video Processing.

A cost-benefit analysis was also conducted to assess the program's economic feasibility. Key findings from this analysis indicate that average monthly income gains from program completion are approximately PKR 23,100, which can offset the program cost (per- completion) in fewer than two months. Therefore, the cost per completion can be recovered in less than a year, making this a viable investment.

The remainder of this paper is organized as follows: Section 2 details the data and methodology used for the analysis. Section 3 presents results, including the demographic profile of participants, the pecuniary and non- pecuniary benefits of the program, insights for program administration, and the cost-benefit analysis. Section 4 provides the conclusion.

Data and Methodology

We evaluate the training program using two data sources: PSDF administrative data on all trainees who signed up for the program, and survey data from a smaller sample of enrolled trainees. This section describes these two data sources and explain the survey data collection approach.

Administrative data

PSDF collected background information and program status for all trainees who signed up for the training courses. The administrative data from 13,493 trainees were analyzedto provide insights into their profiles and progress in the program. Table 1 presents the sample size and basic demographics of trainees at different stages of the program. Of the trainees who registered, less than half were able to enroll in a course. Once enrolled, approximately one in every five trainees completed the program. Trainees are more likely to be males with Matric or Intermediate degrees from urban or developed areas. Nevertheless, a substantial proportion of trainees from marginalized groups (women, less educated, from rural or less developed areas) were present at each stage.

Table 1: Profile of Trainees

	Registered	Enrolled	Completed
Total Sample (Numbers)	13,493	5,090	1,151
Females %	20.3	22.8	21.6
Less than Bachelors Education %*	77.3	76.3	78.9
Rural %**	20.7	20.1	20.9
Low and Medium HDI %***	24.8	24.8	21.9

*Education data available for cohorts 2-3 only.

**Rural classified as the least urban/most rural districts which fall in the bottom quintile in terms of the proportion of urban population as reported in The Population Census (2017).

*** Human Development Index (HDI) classification is based on district level HDI values in UNDP's National Human Development Report (2017).

Survey data

Since the administrative data were collected before and during the program, they lack information on trainees' post-program outcomes. To address this gap, a three-pronged methodological approach was adopted to collect additional data for program evaluation (see Figure 1). After analyzing the administrative data, 40 trainees from the most recent cohort (cohort 3) who passed the enrollment stage were randomly selected. These trainees were equally divided by gender and completion status. Qualitative interviews were conducted with these 40 trainees via phone to understand 1) their goals and objectives before joining the program, 2) their experience during the program, and 3) their experience after the program. Insights from these interviews informed the design of a quantitative survey administered to a larger sample of trainees. The quantitative survey sample included 1,095 trainees from all 3 cohorts who completed the program and 420 trainees from cohort 3 who did not, yielding a total sample of 1,515. To gather more information about marginalized groups, we over-sampled females and stratified the male sample by location when selecting the 420 trainees. From the 1,515 trainees selected for the quantitative survey, we successfully interviewed 685 over the phone. The response rate of 45% is typical for a non-incentivized phone survey.

Table 2 presents the profile of the surveyed trainees. By design, the sample includes a higher proportion of females among the surveyed trainees, and most trainees completed the program. Approximately 38% of the trainees had worked before the program, while 62% are currently employed, with an average monthly income of 39,800 PKR. These trainees tend to be younger, with a median age of 25.

Figure 1: Three-Pronged Methodological Approach

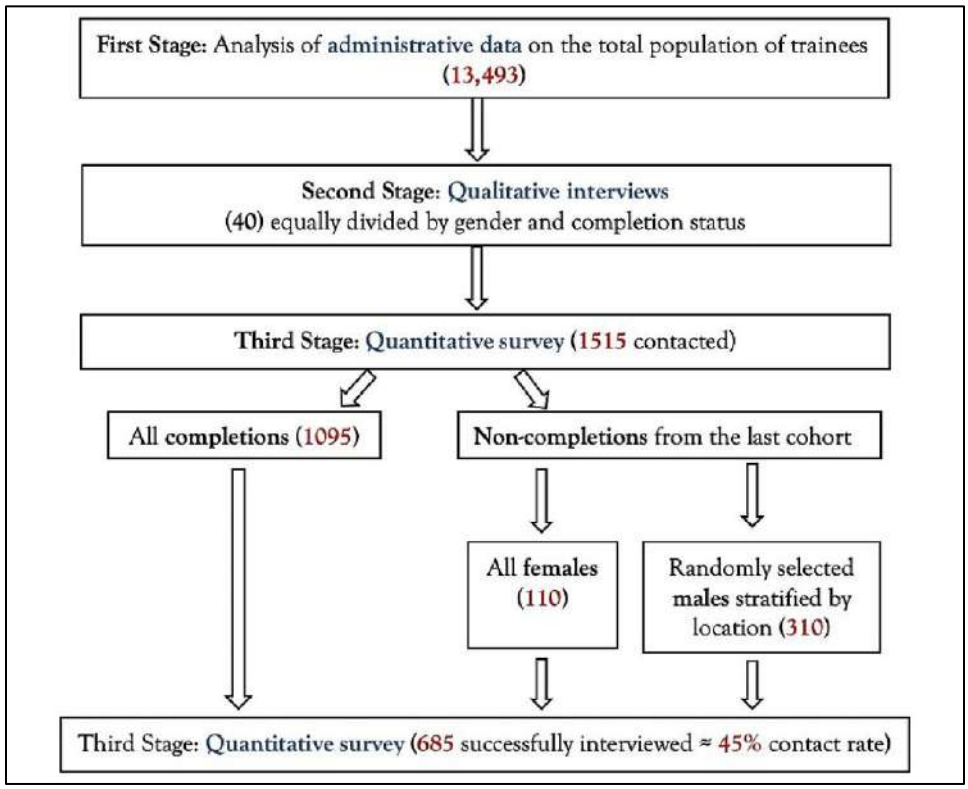


Table 2: Profile of Surveyed Trainees

	Surveyed Successfully
Total Sample (count)	685 (of 1,515)
Females %	27
Completed the course %	74.7
Working before the program %	37.9
Working now %	62.4
Average monthly income now (in thousands) PKR	39.8
Median Age (years)	25

The quantitative survey gathered detailed data on trainees' employment status, earnings, and self-confidence before and after the program. This information allowed us to examine both the financial and nonfinancial benefits of the program (Sections 3.2 and 3.3) and assess the effectiveness of different courses (Section 3.4). Additionally, we collected insights into trainees' expectations and experiences with

the training program. Based on these findings, we offer recommendations for improving the training programs in the future (Section 4).

Results

3.1 What is the Gender, Educational, and Socioeconomic Profile of Trainees, and Does the Program Target Vulnerable Groups?

The training programs at PSDF aim to facilitate the transition into sustainable employment and income-generating opportunities for the poor, vulnerable, and youth. In this section, we evaluate whether program targeting aligns with its stated objectives. To do so, we assess trainee status across four dimensions: gender, education, age, and geographical region. Trainee status is categorized based on their progression through the program: individuals are considered signed-up if they expressed interest in joining the program, invited if they received an invitation email to participate, enrolled if they successfully completed all registration steps on the Coursera platform, and completed if they finished all modules and secured a pass in coursework.

For all figures displaying trainee status information, we use the following color codes: navy blue for sign-ups, maroon for invited, green for enrolled, and yellow for completed.

By gender: Figure 2a presents the gender-disaggregated number of program participants at each stage of the program cycle. The figure reveals two key findings: (i) overall, approximately one in five trainees is female, and (ii) there is attrition at each step, with a higher rate among male trainees compared to females, as evidenced by a substantial decline in program participants from the sign-up stage to the completion stage.

Figure 2b displays the invite rate (the proportion of sign-ups who were invited), the enrollment rate (the proportion of invited trainees who enrolled successfully), and the completion rate (the proportion of enrolled trainees who completed the course) by gender.

Although more men express interest in signing up for the course compared to women, once enrolled, men and women are equally likely to complete it. Course completion rates are only marginally higher for males (22.9%) compared to females (21.4%), and this difference is not statistically significant (Figure 2b). This suggests that while PSDF x Coursera courses initially attract fewer women, those who overcome initial barriers and enroll successfully are serious candidates committed to completing the training program. The equal likelihood of both men and women completing the training may also indicate that the flexible scheduling and virtual

nature of these courses enable women to balance household commitments with the time required for course completion.

By education: Figure 3 presents participation statistics across three education levels: matriculation, intermediate, and bachelor's. Figure 3a displays the total number of individuals who signed up (blue bars), were invited (maroon bars), enrolled (green bars), and subsequently completed their course (yellow bars). We observe that three out of four trainees who enroll in the program report intermediate as their highest completed level of education. Figure 3b shows that the completion rate is 5 percentage points higher for trainees with an intermediate level of education (36.6%) compared to those with a bachelor's degree (31.7%). This gap may be attributed to individuals with higher education levels potentially having stable careers, which could reduce their motivation or incentive to complete the course. Additionally, their work schedules may not provide sufficient flexibility to focus on the training, or they might find the course content less relevant to their career goals, leading to lower completion rates.

Figure 2: Trainee Status by Gender

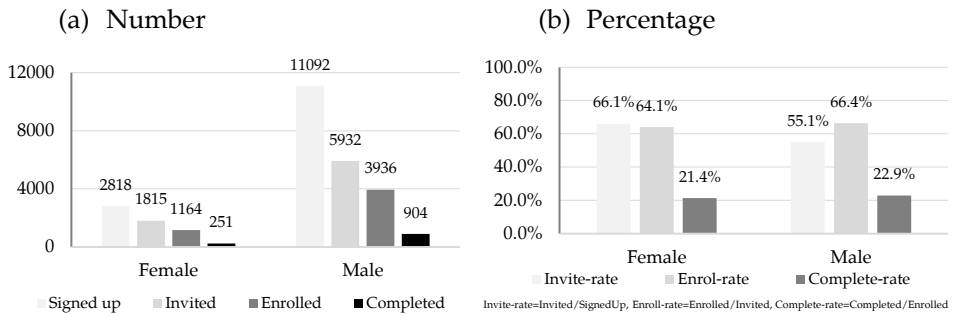
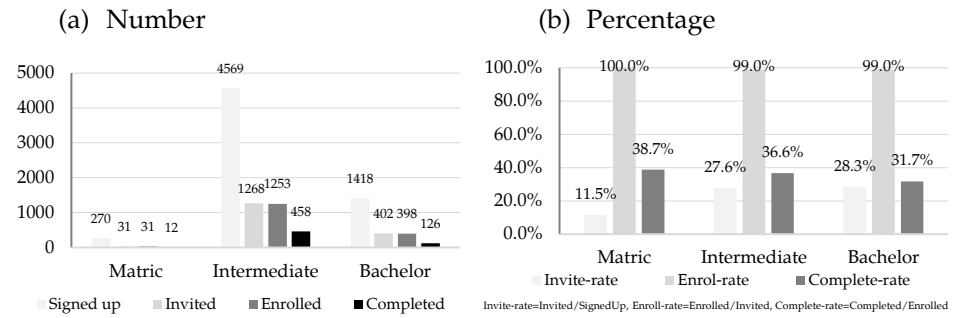


Figure 3: Trainee Status by Education

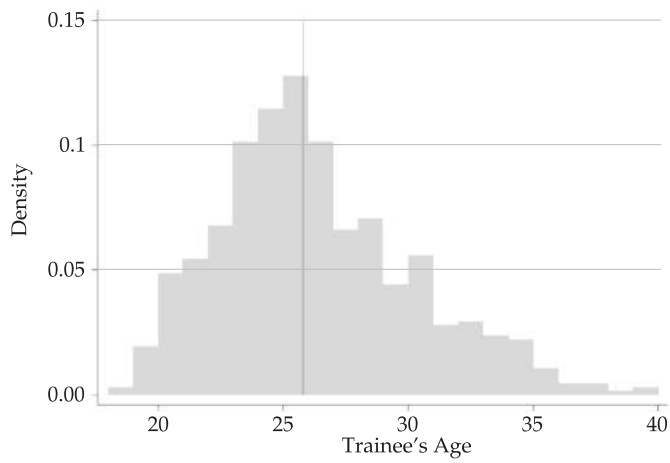


By age: Figure 4a displays the density distribution of the trainees. The median and average age of trainees is 25 years. Females are, on average, 2 years younger than

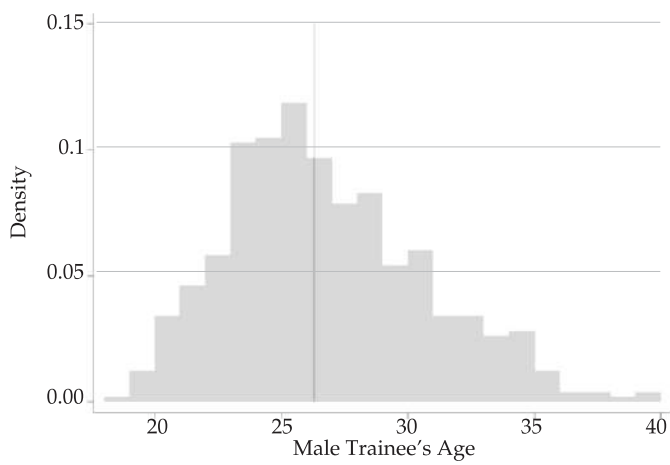
male trainees, as shown in Figures 4b and 4c. We believe this age demographic is significant because it coincides with a period when individuals are either seeking employment or planning a career change, for which they may require job-ready skills. This age group often includes individuals who have worked in entry-level positions for some time and may seek to advance their careers by acquiring new skills. Additionally, young women may face barriers to accessing formal education, leading them to pursue vocational training at a younger age as an alternative means of skill development and empowerment.

Figure 4: Age Distribution of Surveyed Trainees

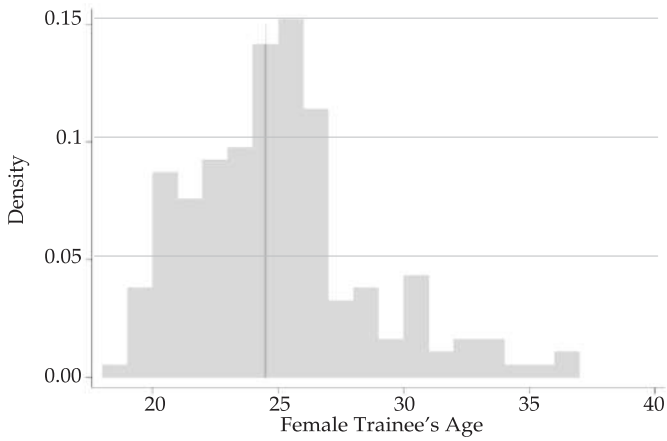
(a) Full Sample



(b) Male



(c) Female



By region

We also analyze the geographic variation in program participation. To accomplish this, we use the following three methods to categorize regions and compare patterns between them:

City districts (Lahore, Rawalpindi, Faisalabad, Gujranwala, Multan) versus other districts in Punjab.

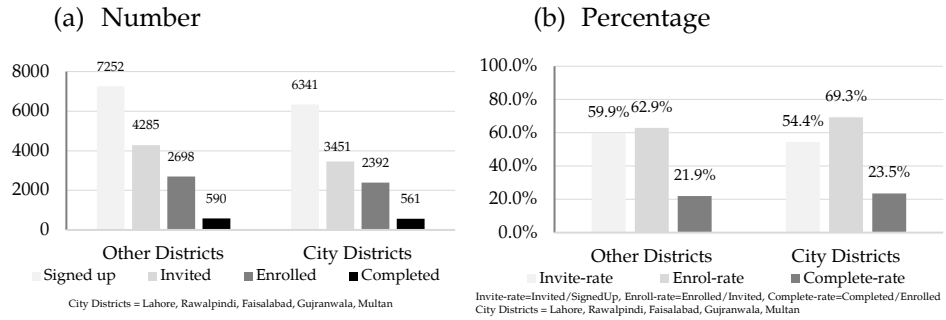
Most urban districts (100% urban population) versus least urban districts (15–19% urban population, as defined by the 2017 Population Census). The average proportion of urban population in Punjab is 27.7%.

Districts with high versus medium and low levels of Human Development Index (HDI), based on district-level HDI values in UNDP's National Human Development Report (2017).

Even though invite rates are higher in other districts (Figure 5b), least urban districts (Figure 6b), and those with low HDI (Figure 7b), individuals from city districts, most urban districts, and high-HDI districts are more likely to enrol successfully, as their enrolment rates are higher.

Despite considerable differences in enrolment, completion rates are only marginally higher in city, most urban, and high-HDI districts versus other, least urban, and low/medium-HDI districts. These differences are not statistically significant. This means trainees from less developed areas are as likely to complete a course as trainees from developed areas in Punjab. This may indicate that other constraints or factors are more relevant for completion rates.

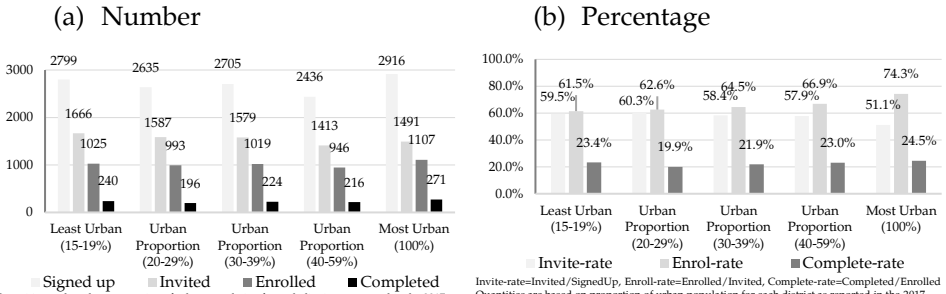
Figure 5: Trainee Status for City Districts versus Others



City Districts = Lahore, Rawalpindi, Faisalabad, Gujranwala, Multan

Invite-rate=Invited/SignedUp, Enroll-rate=Enrolled/Invited, Complete-rate=Completed/Enrolled
City Districts = Lahore, Rawalpindi, Faisalabad, Gujranwala, Multan

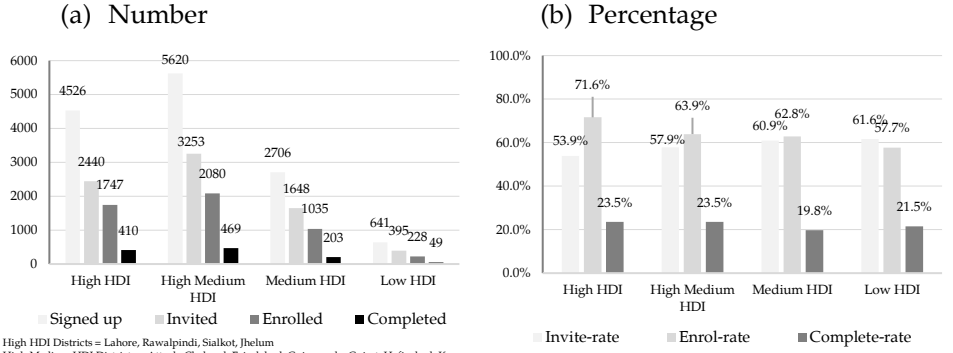
Figure 6: Trainee Status by District's Rural/Urban Classification



Quantities are based on proportion of urban population for each district as reported in the 2017 Poulation Census

Invite-rate=Invited/SignedUp, Enroll-rate=Enrolled/Invited, Complete-rate=Completed/Enrolled
Quantities are based on proportion of urban population for each district as reported in the 2017 Poulation Census

Figure 7: Trainee Status by District's Human Development Classification



High HDI Districts = Lahore, Rawalpindi, Sialkot, Jhelum
High Medium HDI Districts = Attock, Chakwal, Faisalabad, Gujranwala, Gujrat, Hafizabad, Kasur, Khushab, Layyah, Mandi Bahauddin, Multan, Nankana Sahib, Narowal, Okara, Sahiwal, Sargodha, Sheikhupura, T.T.Singh
Medium HDI Districts = Bahawalpur, Bhakkar, Chiniot, Jhang, Khanewal, Lodhran, Mianwali, Pakpattan, RY Khan, Vehari
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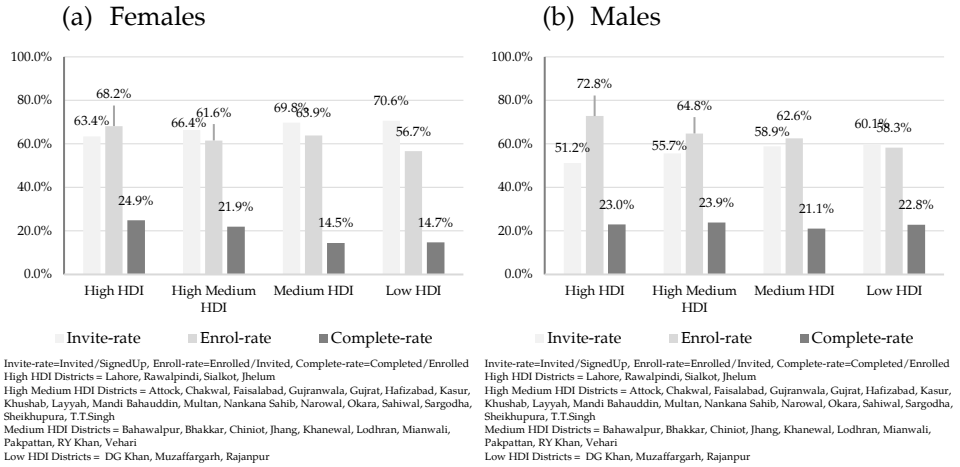
Low HDI Districts = DG Khan, Muzaffargarh, Rajanpur

While we do not observe disparities in completion rates by gender or region at an aggregate level (Figure 2), significant gender disparities emerge in low-human development index (HDI) areas. Male completion rates (22.8%) are 8 percentage points higher than those of females (14.7%; Figure 8).

Moreover, constraints to completion disproportionately affect females. A male trainee in a low-HDI district is as likely to complete the course (22.8%) as a male trainee in a high-HDI district (23%). However, female trainees in low-HDI areas (14.7%) are 10% less likely to complete the program compared to their counterparts in high-HDI regions (24.9%). This disparity aligns with structural challenges in less developed regions, such as gender gaps in educational access, financial constraints, conservative gender norms, inadequate support services for skill development, and limited employment opportunities for women. Improving completion rates in these regions may require comprehensive efforts to address intersecting socioeconomic, cultural, and structural barriers.

Figure 8: Trainee Status by District's Human Development Classification and Gender



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3.2 What are the pecuniary benefits of the program on employment and in- come?

In this section, we evaluate the pecuniary benefits of program completion on trainees' employment and income. We categorize the sample into three groups: students, unemployed individuals, and those already employed before the program began. We assess the program's impact separately for each group.

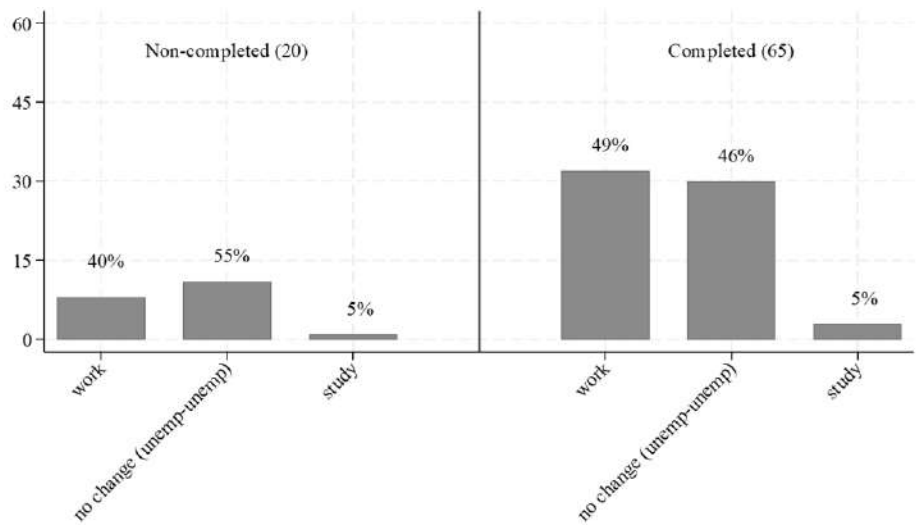
For students: 340 trainees were students when they started the program, with a completion rate of 77%. We examine whether completing the program influences students' transition to employment. Figure 9 illustrates three types of transitions:

from study to work, from study to unemployment or job search, and no change in student status. We compare these transitions based on completion status. Each bar in Figure 9 represents the total number of trainees who experienced the transition, with percentages above each bar indicating the proportion relative to completed and non-completed trainees.

The primary finding from Figure 9 is that students who completed the program had a 9 percentage point higher transition-to-work rate compared to those who did not complete it. This suggests that students who finished the program were more likely to secure employment opportunities than their non-completing peers.

A related finding from Figure 9 is that students who completed the course are more likely to transition out of study, as evidenced by the proportion of students with no status change after the program. We hypothesize that this is because students in their final years are particularly motivated to acquire skills that are in high demand by employers, which may contribute to their elevated program completion rate.

Figure 9: Transition for Student Trainees



For the unemployed: 85 trainees were unemployed before joining the program, with 65 completing it, yielding a completion rate of 76%. We examine the program's impact on their transition out of unemployment. Figure 10 illustrates three types of transitions: from unemployment to work, no transition, and from unemployment to school. We analyze the sample by completion status to assess the effect of program completion.

Figure 10: Transition for Previously Unemployed Trainees

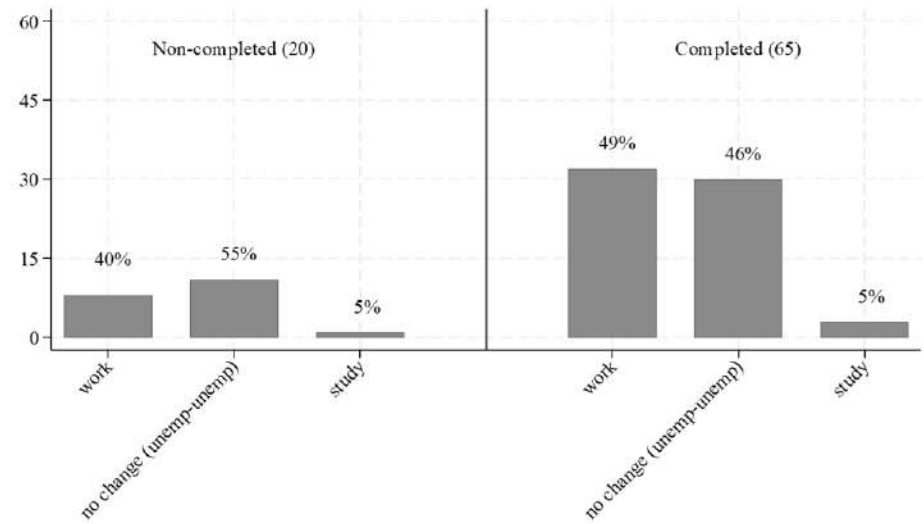
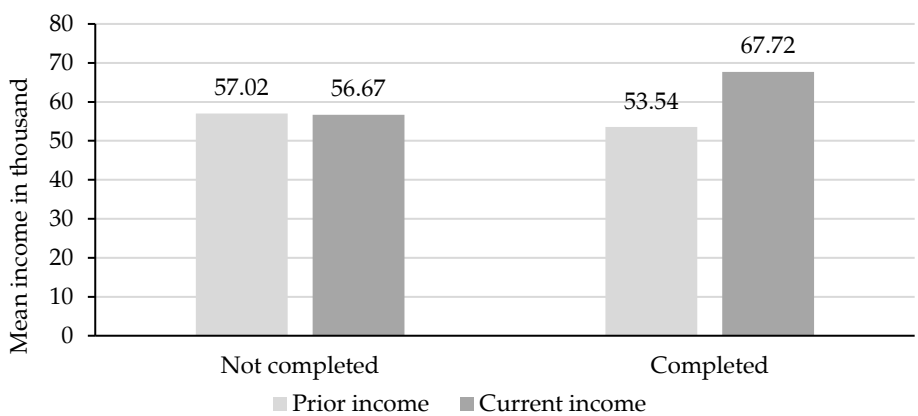


Figure 10 indicates that the transition to work after the program is 9 percentage points higher among unemployed trainees who completed the course. This suggests that program completion had substantial, positive effects on unemployed trainees' transition to employment.

For the employed: 259 trainees were employed when they started the program, with 183 completing it. We investigate whether previously employed trainees experienced any changes in income following the program. Figure 11 displays trainees' prior and current income by completion status.

Figure 11: Income Change for Previously Employed Trainees



259 trainees employed before the program, of these 183 completed while 76 did not complete the course

Trainees who completed the program had comparable prior income levels to those who did not complete, yet they now receive a substantial additional monthly income of PKR 14,000. In contrast, no discernible change in income was observed for non-completers.

Our analysis demonstrates that completing PSDF's training programs yields considerable pecuniary benefits, both in terms of employment transitions and earnings. Specifically, trainees who completed the program are more likely to secure employment or experience a notable salary increase.

3.3 What are the non-pecuniary benefits of the program on confidence, career goals and personal development?

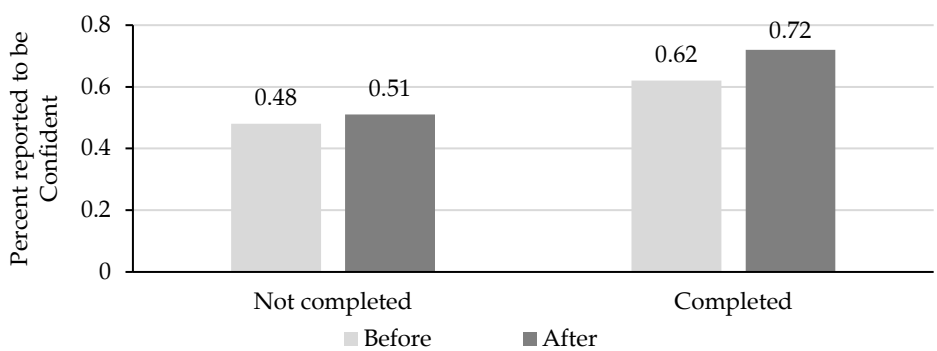
Besides the pecuniary benefits, acquiring new skills can also lead to improvements in non-pecuniary aspects, such as trainees' confidence, career goals, and personal development.

On self-report confidence: We asked trainees to report their retrospective level of confidence for completing the program before they started and their current level of confidence for completing a similar training program in the future. Figure 12 shows the self-reported confidence by completion status.

Two patterns emerge: Among trainees who completed the course, their confidence level improved. No significant change was observed for those who did not complete the program. Additionally, trainees who completed the course had a significantly higher level of confidence than others before the program began. This might suggest that interventions aimed at boosting self-confidence could improve completion rates.

Appendix Figure A1 shows that confidence improvements were observed for both men and women who completed the course, with similar magnitudes.

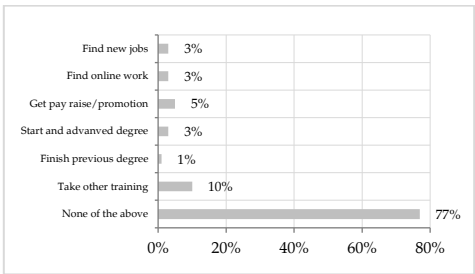
Figure 12: Change in Confidence by Completion



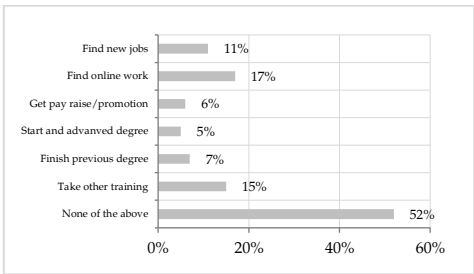
On career goals: To understand the program impact on trainees' career goals, we ask trainees whether they have experienced various changes after the program. Figure 13 reports the results by completion status. Compared to trainees who did not complete the program, those who did are much more likely to experience positive changes such as finding new/online jobs, getting pay raise, finishing/starting a degree, and taking other training programs. Appendix Figures A2 and A3 show the disaggregated results by gender and the same results are true for both males and females.

Figure 13: Impact on Career Goals

(a) Non-completed



(b) Completed

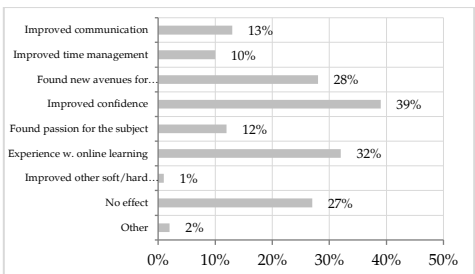


To understand the program's impact on trainees' career goals, we asked whether they experienced various changes after the program. Figure 13 reports the results by completion status. Compared to trainees who did not complete the program, those who did are more likely to experience positive changes such as finding new or online jobs, receiving a pay raise, finishing or starting a degree, and taking other training programs.

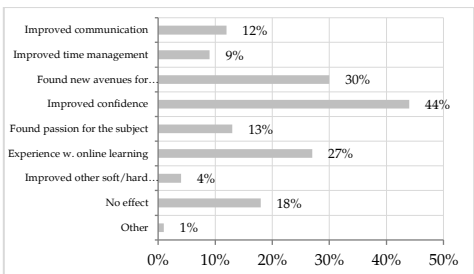
Appendix Figures A2 and A3 provide disaggregated results by gender, confirming that these outcomes hold true for both males and females.

Figure 14: Impact on Personal Development

(a) Non-completed



(b) Completed



3.4 Which courses are most effective at income generation?

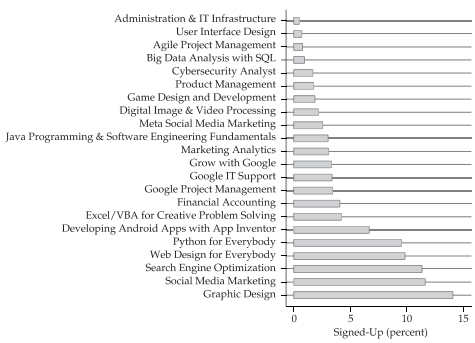
In this section, we explore which courses are most popular among students and which are most effective at generating income. Figure 15 illustrates the most popular courses at the sign-up, enrollment, and completion stages.

As shown in Figures 15a and 15b, the top five courses with the highest number of sign-ups and enrollments are Graphic Design, Social Media Marketing, Search Engine Optimization, Web Design for Everybody, and Python for Everybody. However, these courses do not have the highest completion rates.

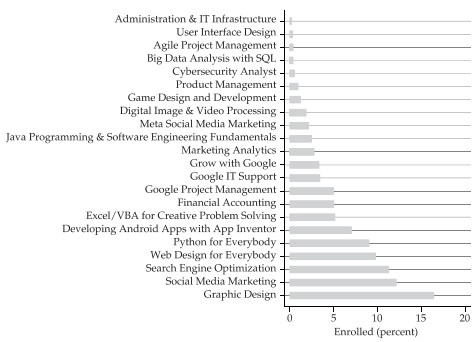
Figure 15c reveals that the top five courses with the highest completion rates are Financial Accounting, Marketing Analytics, Agile Project Management, Google IT Support, and Administration & IT Infrastructure. This suggests that while certain courses may attract more initial interest, others are more effective in retaining students through to completion.

Figure 15: Most Popular Courses

(a) Sign-up



(b) Enrolment



(c) Completion

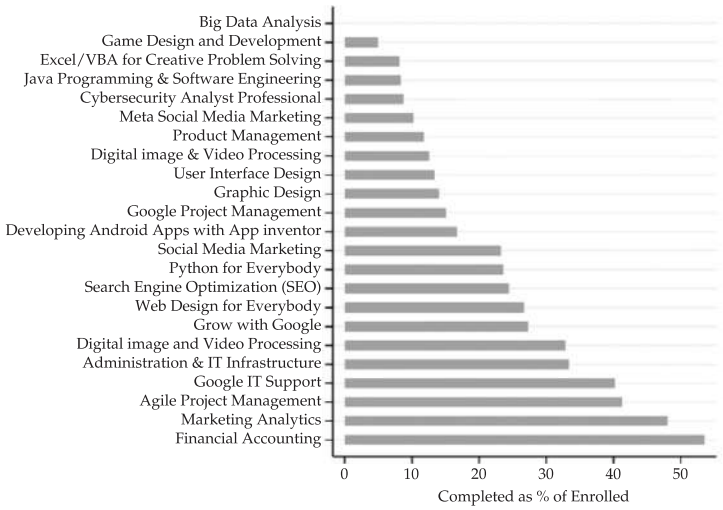
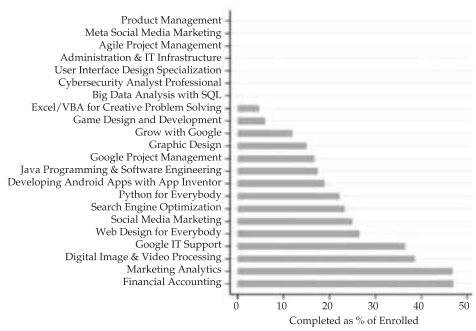


Figure 16 presents gender-disaggregated program completion rates, revealing that Financial Accounting, Marketing Analytics, and Google IT Support are among the top five courses with the highest completion rates for both male and female trainees.

Figure 16: Completion by Gender and Program Choice

(a) Female



(b) Male

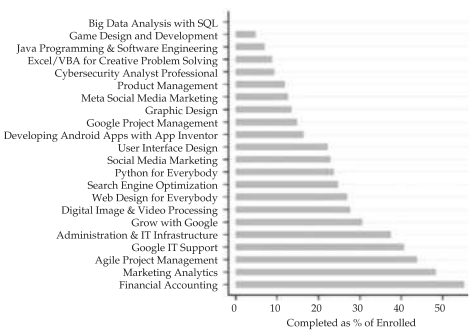
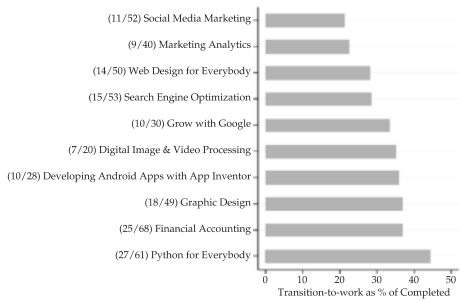


Figure 17 highlights the top ten courses with the highest transition-to-work rates after program completion (17a) and mean monthly income (17b). The top five most effective courses for transitioning to work are Python for Everyone, Financial Accounting, Graphic Design, Developing Android Apps with App Inventor, and Digital Image & Video Processing. Notably, some of these courses are also among

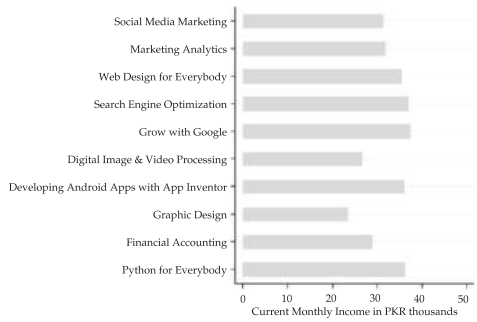
the most popular at the sign-up stage, although they often have lower completion rates. This suggests that trainees have some awareness of which skills are most effective at generating income, but acquiring these skills poses challenges.

Figure 17: Top 10 Courses

(a) Courses with Highest Transition-to-work Rates



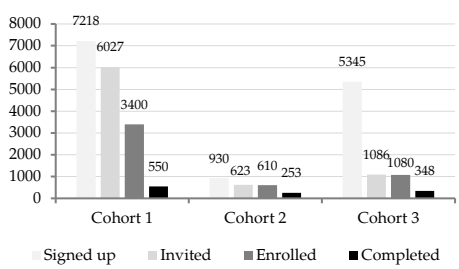
(b) Average Monthly Income Gains



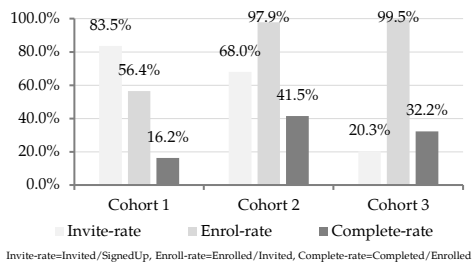
We analyzed completion rates separately for each cohort to whom the program was offered. Figure 18 shows that completion rates have doubled from 16% in the first cohort to 32% in the last cohort.

Figure 18: Trainee Status by Cohort

(a) Count



(b) Percentage

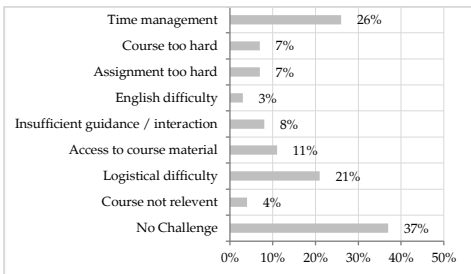


However, the trainee survey reveals that trainees continue to report challenges to completion. Figure 19 shows the challenges reported by trainees, categorized by completion status. Notably, time management is the most frequently cited challenge for both trainees who completed the course and those who did not. This is understandable, as balancing work, family, and other commitments can be difficult. Procrastination or ineffective planning may also contribute to the challenges in managing time. This highlights the need to integrate time management skills into

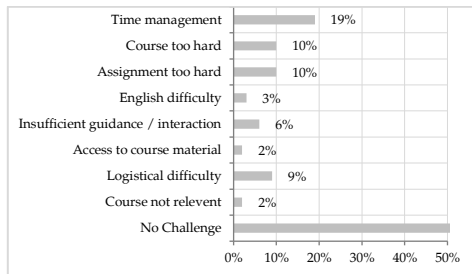
the curriculum or provide resources and support to help trainees develop these skills, such as through goal setting or positive reinforcement. Time management is a valuable lifelong skill that can benefit trainees not only during their training but also in their future careers.

Figure 19: Challenges to Completion

(a) Non-completed



(b) Completed



From a policy perspective, an important challenge cited by several trainees was the insufficient guidance or interaction with training providers. In separate focus group discussions involving at least ten trainees, participants expressed the need for continued guidance and the availability of support services to address issues related to understanding course content or navigating the platform. For instance, approximately ten percent of trainees cited logistical difficulties, course content challenges, or overly demanding assignments as significant barriers to completion. This highlights the importance of creating online forums or communities where trainees can interact with peers and seek guidance.

Additionally, there are other challenges that, although less frequently reported, are crucial and need to be addressed to improve completion rates. For example, language barriers and access to course materials are significant issues that can hinder trainees' progress.

3.5 Cost-benefit analysis

To assess the long-run viability of the online training program from PSDF's perspective, we compare its costs and benefits. Table 3 outlines the program costs and estimates the average cost per completion to be PKR 27,000 for a three-month long course. This analysis provides insight into the financial sustainability of the program and helps evaluate whether the benefits justify the investment.

Table 3: Cost per Completion

Total Licenses procured (last year)	530
Total Completions in 9 months (actual)	606
Total Completions in 12 months (Predicted)	808
License procurement cost (PKR) yearly	20,252,000
Media cost (PKR) yearly	1,087,955
Total cost (license + administrative)	**21,339,954**
Cost per completion (12 months)	26,410

Table 4 details the pecuniary benefits of program completion by trainee type, focusing on those who completed the program. For trainees who were previously employed, they experienced average monthly income gains of PKR 14,000, allowing them to recover the program cost in approximately two months. A significant proportion of student trainees successfully transitioned into employment, with average monthly income gains of PKR 26,500, enabling them to recover the cost in just one month. For those who were previously unemployed, the average income gains were PKR 32,500, allowing them to recover the program cost in less than one month. Overall, the average monthly income gains from program completion are approximately PKR 23,100, which can offset the per-completion cost in less than two months.

Table 4: Pecuniary Program Benefits

Trainee Type	Avg. Monthly Income gain (PKR)	Months Taken to Recover Cost
Previously employed (N = 184)	14,000	2
Previously student (N = 263)	26,500	1
Previously unemployed (N = 65)	32,500	<1
Total (N = 512)	23,100	1.1

Our comparison of program costs and pecuniary benefits for trainees reveals that the benefits outweigh the costs, making the program a viable use of PSDF resources. We highlight two key takeaways from this analysis:

The program also generates significant non-pecuniary benefits for trainees, such as improvements in self-confidence and personal development. These benefits, while not quantifiable, strengthen the case for continuing the program.

Trainees who completed the program benefited in multiple dimensions. Therefore, a crucial task for PSDF is to support trainees who struggle with the course. The next section will discuss recommendations for improving completion rates.

4. Conclusions, Recommendations and Way Forward

To further understand whether the training courses meet the demand for skills in the labor market, we engaged with industry experts from Rozee.pk, Pakistan's leading job portal. Key insights from these conversations include that over the past year, there has been a significant reduction in hiring by 30% across firms listed on Rozee.pk. However, the ICT and freelancing sectors have continued to expand, with a growing demand for skilled labor.

The top skills in demand include programming, designing, finance, and Microsoft skills, which align with those targeted by PSDF's training programs. Additionally, there is an increasing trend of professionals turning to freelancing to create additional income streams.

These findings confirm that PSDF's training programs target the right skills, enabling trainees to capitalize on the growing ICT and freelancing market despite economic challenges. The flexibility of freelancing jobs makes these digital skills particularly valuable for marginalized groups, such as women and adolescents, to enter the labor force and generate additional income.

To further enhance the effectiveness of these programs, two key challenges need to be addressed. First, improving completion rates is essential, as administrative data indicates that only one in five trainees completes the course after enrolment. Common obstacles include logistical issues with the course, lack of interaction, and time management challenges.

Second, helping trainees with skill utilization is crucial. Qualitative interviews revealed that many trainees fail to utilize their new skills for income-generating activities. Common reasons include the skills being perceived as too basic, uncertainty about how to apply them, and difficulty starting a freelancing career. Addressing these challenges will be crucial for maximizing the impact of PSDF's training initiatives.

To enhance the effectiveness of PSDF's training programs, we propose several steps to be undertaken before, during, and after the program.

Before the program begins, PSDF could conduct an online skills test for applicants to help them select courses at the right difficulty level. Our survey data reveals significant heterogeneity in trainees' background knowledge, so this assessment could address potential demotivation when courses are too basic or difficult. Additionally, inviting trainees enrolled in the same course to an in-person session could be beneficial. During this meet-and-greet, participants can connect with others interested in the same program, fostering a learning community. They

can also be encouraged to set up a WhatsApp or Facebook group to enable communication with each other throughout the program.

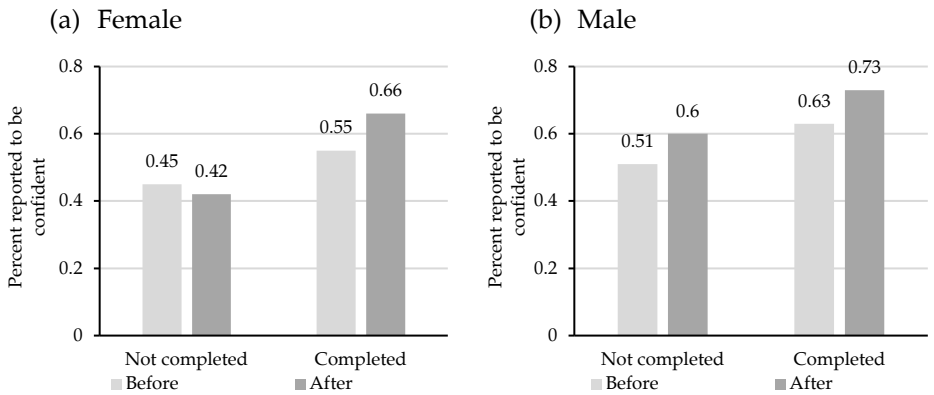
During the program, we propose introducing a mentorship program where graduate trainees guide current trainees throughout the course. Mentors can assist trainees with limited experience in online learning by helping them navigate the Coursera platform, address logistical issues, and provide tips on time management and career guidance.

After the program, we suggest offering follow-up sessions focused on skill utilization and job opportunities. These sessions could cover topics such as starting a freelancing career and provide guidance on where to find relevant job openings. Trainees, particularly women from disadvantaged backgrounds, often struggle to apply their skills without additional support. The follow-up sessions could feature successful graduates or industry experts sharing their experiences with trainees post-program. Alternatively, connecting trainees with freelancing firms could be an effective way to help them launch a new career path.

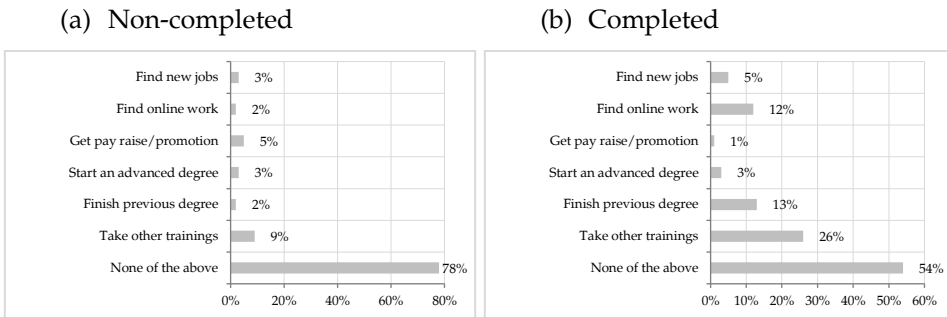
Going forward, these steps can be piloted with a smaller sample of trainees to assess their effectiveness. Some of these recommendations may be quicker to implement at relatively low costs, while others may require expertise in skills assessment. For the latter, PSDF might consider collaborating with specialized organizations that offer such services, such as Rozee.pk. This collaboration could enhance the program's effectiveness and ensure that trainees receive the support they need to succeed.

Appendix A

Appendix Figure A1: Confidence Change by Gender

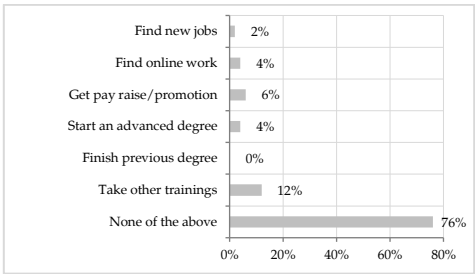


Appendix Figure A2: Impact on Career Goals for Females

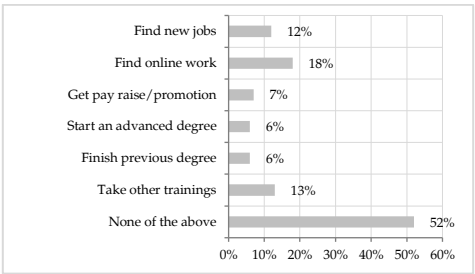


Appendix Figure A3: Impact on Career Goals for Males

(a) Non-completed

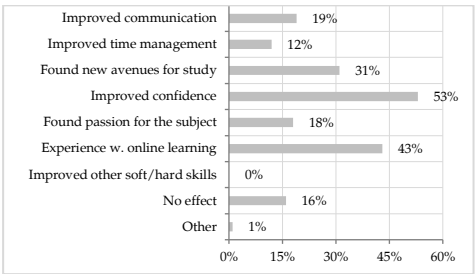


(b) Completed

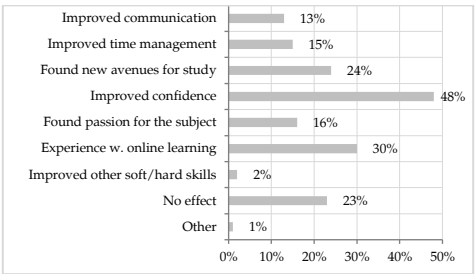


Appendix Figure A4: Impact on Personal Development for Females

(a) Non-completed

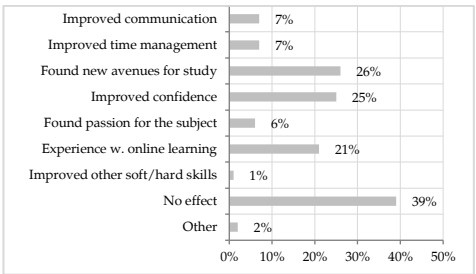


(b) Completed



Appendix Figure A5: Impact on Personal Development for Males

(a) Non-completed



(b) Completed