The COVID-19 Pandemic, Structural Transformation, and Training Outcomes

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Background

- **The COVID-19 pandemic took a toll on Indonesia's economy and affected its labor market** – at least 15.7 million workers experience reduced working hours, 1.6 million become unemployed, 1.1 million to be furloughed, and 0.7 million exit the labor force (Statistics Indonesia, 2021)
- The pandemic also accelerates digital technology adoption, but the **adjustments in education occur at a slower pace**.
- The government of Indonesia introduced **Kartu Prakerja Program to accelerate the improvement in labor supply**, by providing skilling, reskilling and upskilling.
    - Kartu Prakerja has reached 5.5 million beneficiaries from 514 cities/districts across Indonesia by the end of 2020 and more than 17 million in 2023 (Prakerja, 2023).
    - In 2022, the program has 1,200+ courses from 180 training providers that can be accessed through six digital platforms.
- In 2019, **94 million adults in Indonesia were unable to access the internet** on a mobile device and even fewer people had access to fixed broadband internet. Around 60-70% living in the eastern region of Indonesia are inadequately connected due to variable quality of services (Setiawan et al., 2022).
- **The availability of a base transceiver station (BTS) is essential to improve internet quality in certain areas**. It becomes the main supporting feature that closely related to the Kartu Prakerja Program due to its online format training.

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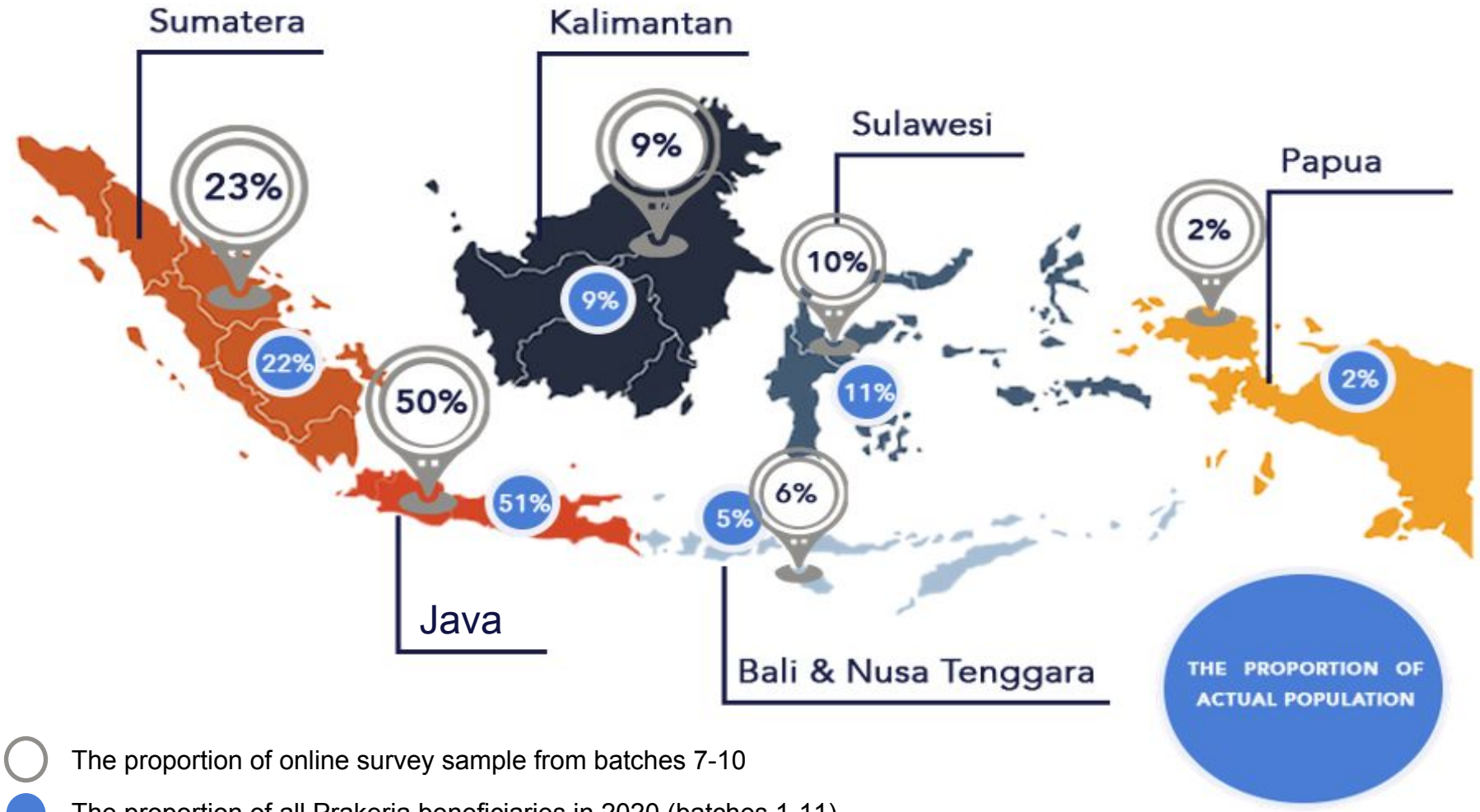
Methodology

Population	**Beneficiaries and non-beneficiaries** (as a control group) of Kartu Prakerja spread throughout the region in Indonesia.
Sub-population	Beneficiaries of **batches 7-10**; non-beneficiaries who registered on batches 7-10 and have not received Kartu Prakerja up to batch 20. the study evaluated the impact after 1 year, and training period for those batches is relatively ideal, September-December 2020, so the beneficiaries can complete the first training and other trainings.
Sampling	**Stratified random sampling** method with two main controls, i.e., the proportion of **gender** and **residential location by region**, "Region" is classified into Sumatera, Java, Bali-Nusa Tenggara, Kalimantan, Sulawesi, and Maluka-Papua.
Number of sample	**2,156 individuals** that consist of the main group of beneficiaries and a control or non-beneficiaries (1,078 respondents for each group).
Margin of Error (MoE)	Margin of error of around **3%** and a confidence level of **95%**.
Data Collection	• For **urban amenities variables,** data was obtained from recent Potensi Desa (Podes) data. • **The online survey** was conducted to 2,156 respondents, they filled out the survey independently through an electronic survey platform (e-survey). These two different data sources are part of a **quantitative methods**.
	Phone in-depth interviews were conducted to 188 beneficiaries and non-beneficiaries, 5 training providers, 3 digital platforms and 2 payment partners, this is as the part of **qualitative methods**, aimed to deepen and enrich analysis.
Quality Control	**Quality control is carried out in layers** ranging from the enumerator recruitment process, the implementation of training to the enumerator, the data collection process to validation and verification after data collection.
Survey Period	September 24 – November 1, 2021
Survey Collaboration	This survey was conducted with the cooperation and support of the **United Nations Development Programme (UNDP) Indonesia,** the **Project Management Officer of Kartu Prakerja (MPPKP),** and the **Fiscal Policy Agency – the Ministry of Finance.**
Study Collaboration	Study of the COVID-19 Pandemic, Structural Transformation, and Training Outcomes is supported by **Economic Research Institute for ASEAN and East Asia (ERIA)**, 2022.

Most of Kartu Prakerja beneficiaries live in Java island

Figure 1. Distribution of Sample and Population of Kartu Prakerja Beneficiaries



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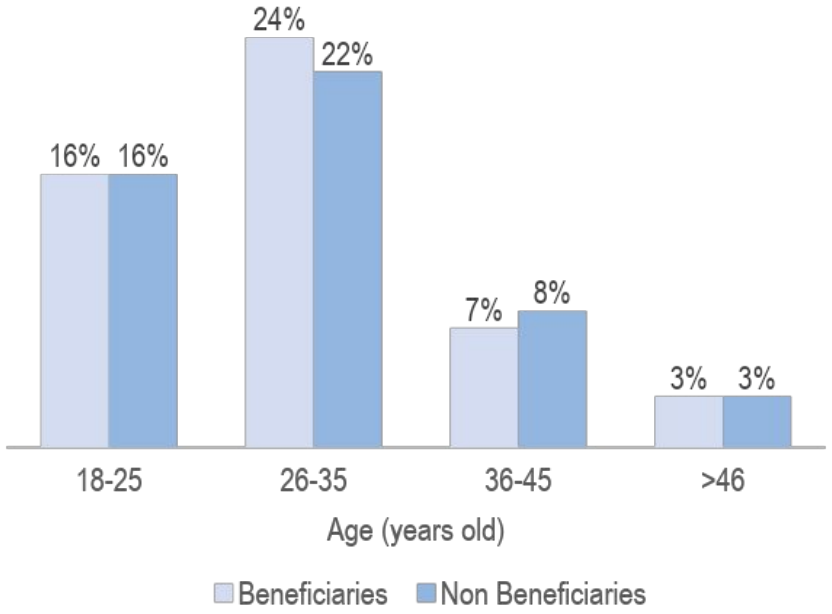
Most respondents are 26-35 years old and have a high school diploma

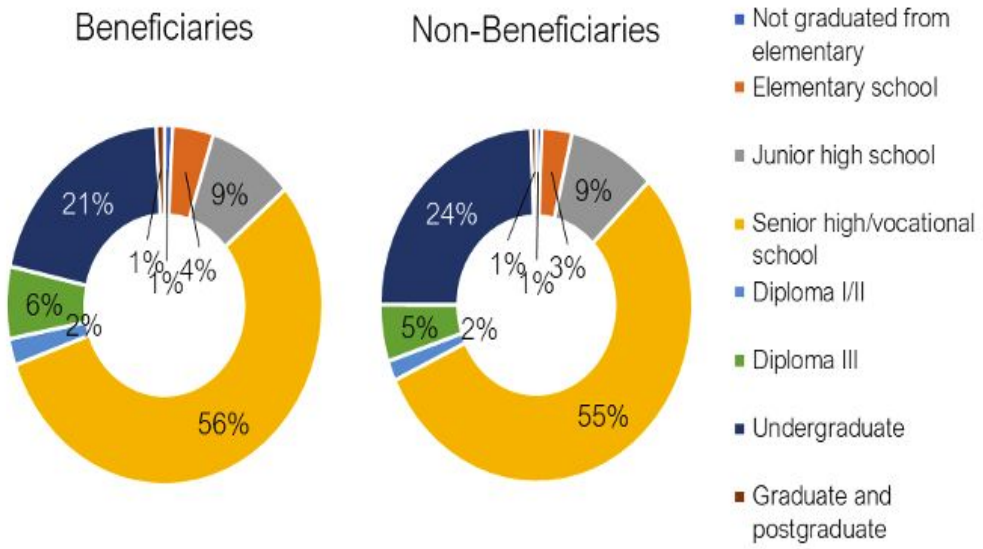
Figure 2. Respondent Characteristics by Age Group



Source: Authors' Calculation

- Most beneficiaries and non-beneficiaries are 26-35 years old, followed by the age group of 18-25 years old.

Figure 3. Respondent Characteristics by Education Attainment



Source: Authors' Calculation

- The majority of beneficiaries and non-beneficiaries have a high school diploma.
- Total of beneficiaries with a university degree (21%) is slightly lower than the proportion of non-beneficiaries (24%).

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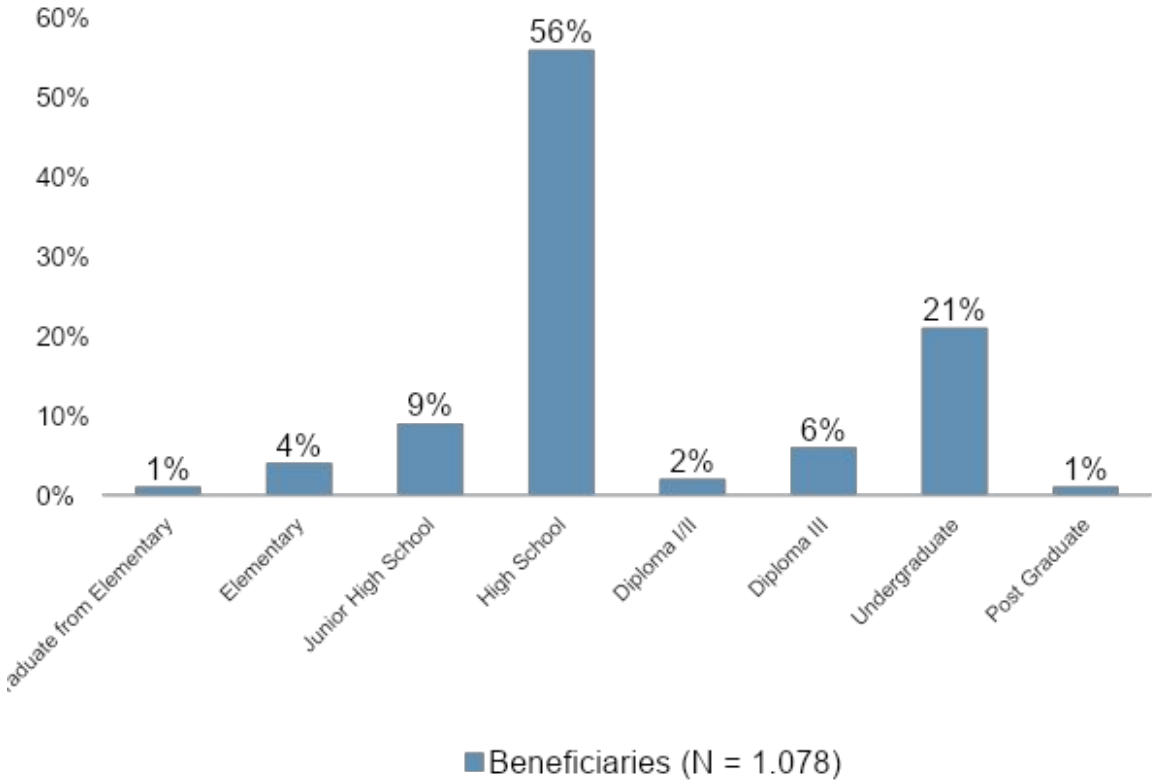
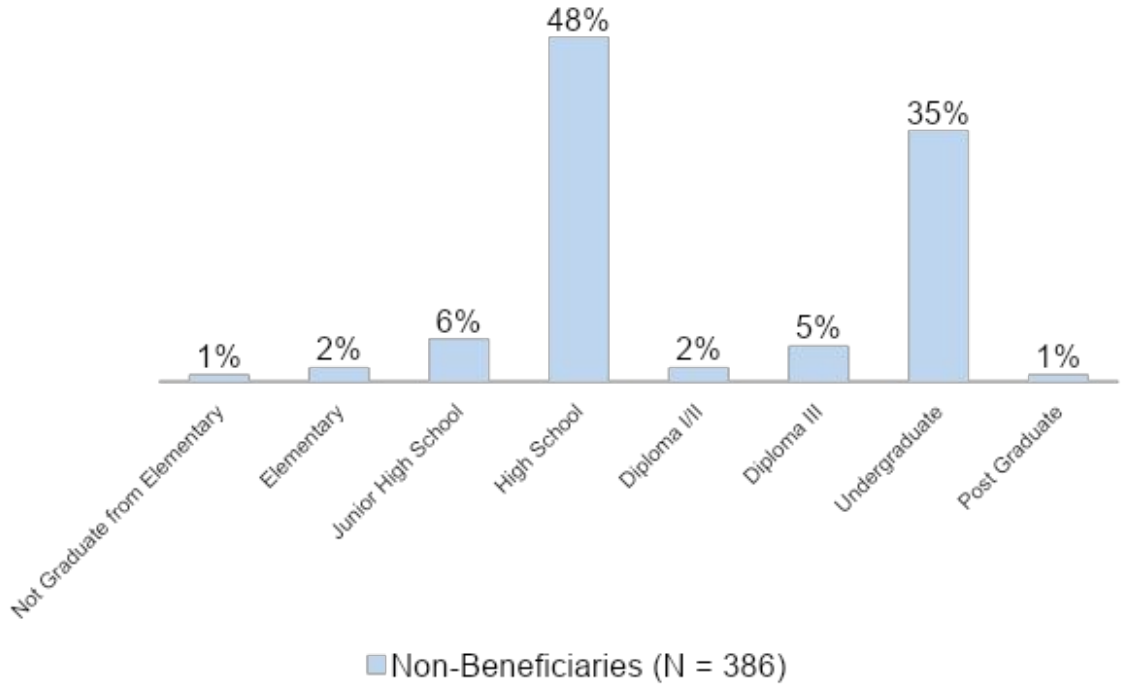
Respondent who took any training (Kartu Prakerja or other trainings) by educational background





Source: Authors' Calculation

- Only around 386 of non-beneficiaries (18% of total sample) had taken training(s) before. Most of them are senior high school graduates (48%) or university graduates (35%).
- The proportion of beneficiaries with high school or lower education backgrounds is consistently higher than that of non-beneficiaries.

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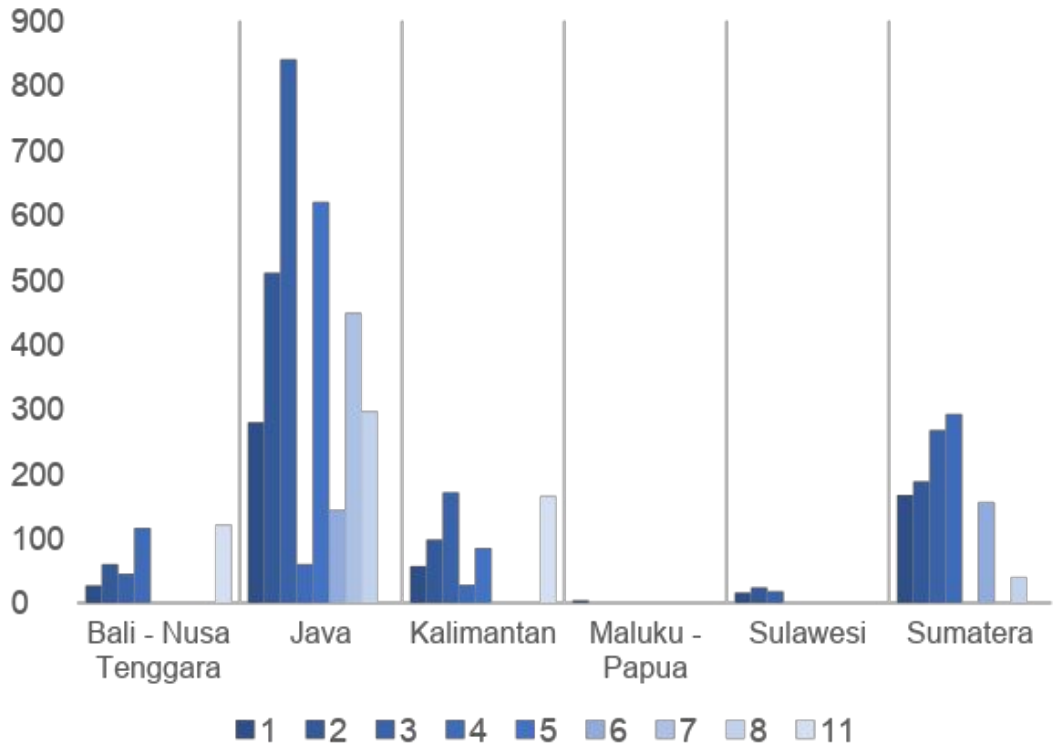
Respondents mostly live in areas that have one to three BTS

Figure 5. Distribution of BTS in Indonesia



Source: Authors' Calculation based on PODeS 2021 data

Respondent mostly live in the district with good quality mobile phones and internet signals supported by a higher number of base transceiver station (BTS).

Box 1. Base Transceiver Station (BTS) Overview

Base Transceiver Station (BTS) is a transmitting station used to transmit and receive radio signals to telecommunication devices, such as landline phones, cellular phones, and other devices. This telecommunications infrastructure is essential for wireless communication between operator networks and telecommunication devices (BAKTI Kominfo, 2019). According to Statistics Indonesia (2021), BTS towers are available in 39,062 villages in Indonesia. In general, the length of the BTS tower is around 40-75 meters. The length of this infrastructure may vary by region, depending on geographical conditions and the extent of the targeted network coverage (BAKTI Kominfo, 2019). Research conducted by Arianto Pelly et al. (2018) in 4 sub-districts in West Pasaman Regency shows that one BTS infrastructure can serve signals up to 3.24 km^2. The signal coverage area may be different for other regions. The number and location of BTS placement must be effective and fit the conditions of the service area because this affects the capacity and quality of the network received by cellular phone service users (Yadnya et al., 2022).

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This study employs a combination of econometrics methods to evaluate the impact

The **Pooled OLS** is used to estimate causal relations using observational data. For **Mincer Wage Equation**, the **Instrumental Variable (IV)** deals with the possibility of endogeneity issues due to unobservable variables such as ability.

The model is formulated ad follows:

$$Y_{n,t} = \alpha + \beta_1 prakerja_{n,t} + \beta_2 bts_{n,t} + \beta_3 Z_{n,t} + \varepsilon_{n,t} \quad \dots (1)$$

Note:

$Y_{n,t}$	: dependent variables (competency, productivity, competitiveness, or entrepreneurship skills, and monthly income in the Wage Equation)
$prakerja_{n,t}$	: dummy of beneficiaries of Kartu Prakerja (1: Prakerja beneficiaries, 0: non-beneficiaries)
$bts_{n,t}$	: number of Base Transceiver Station (BTS)
$Z_{n,t}$	: control variables (personal characteristics including age (in year), year of education (in year), female (dummy of gender, 1: female and 0: male), married (dummy for marital status, 1: married and 0: otherwise)
a	: constant
b	: coefficient
$\varepsilon_{n,t}$	: error terms

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The dependent variables in this study (competencies, productivity, competitiveness, and entrepreneurship skills) is based on self-assessment

Figure 6. 12 Self-assessment Statements About Competencies

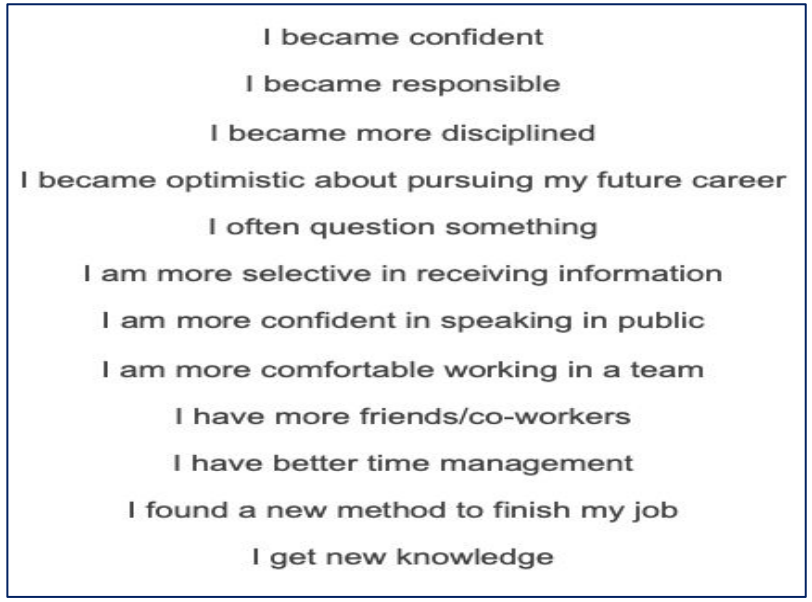

Figure 7. 6 Self-assessment Statements About Entrepreneurship Skills

- **The perception of productivity** was assessed from three statements related to the work pace, load, and accuracy (OECD, 2001). This paper also analyses the wages data as proxy of productivity.
- For **competitiveness,** the respondents were given three statements regarding self-assessment on competency, productivity, and performance compared to peers (Wang et al., 2018)

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Both Kartu Prakerja and good internet access improve training outcomes

Table 1. The relationship of Kartu Prakerja Program Completion and Internet Access, with Competencies, Productivity, Competitiveness or Entrepreneurship Skills, using Pooled OLS

Variables	(1) Competencies	(2) Productivity	(3) Competitiveness	(4) Entrepreneurship Skills
prakerja	**0.741*** **	**0.235*** **	**0.504*** **	**1.506*** **
	-0.21	**-0.066**	**-0.134**	**-0.441**
bts	**0.114***	**0.047** **	**0.070***	**0.004**
	-0.055	**-0.017**	**-0.035**	**-0.115**
age	-0.036**	-0.010*	-0.025**	0.136***
	-0.013	-0.004	-0.008	-0.027
year of education	0.154***	0.040**	0.045*	0.066
	-0.040	-0.012	-0.025	-0.083
female	-0.10	0.259***	-0.112	0.265
	-0.212	-0.067	-0.135	-0.444
_cons	31.84***	8.383***	17.64***	-2.186
	-0.675	-0.213	-0.431	-1.416
N	2156	2156	2156	2156
R-sq	0.019	0.025	0.014	0.017

Source: Authors' Calculation
*Standard errors in parentheses: *** p<0.01, ** p<0.05, *p<0.1*

- Kartu Prakerja has a **positive and significant impact** on competencies, productivity, competitiveness, and entrepreneurship for beneficiaries.
  - Improvements occur for work competencies, productivity, competitiveness, and entrepreneurship skills of 74 percentage points (2.2%), 24 percentage points (2.7%), 50 percentage points (2.9%), and 150 percentage points (41%), respectively.
- Good internet access affects the **increase** in competencies, productivity, and competitiveness of 11.4 percentage points (0.3%), 4.7 percentage points (0.5%), and 7 percentage points (0.4%), respectively – the effects are **relatively lower compared to Kartu Prakerja** coefficients.
- Internet access has an **insignificant effect** on entrepreneurship skills improvement.
- In terms of control variables,
  - Year of education and age has a positive correlation with competencies, productivity, and competitiveness.
  - Female has a positive and significant effect on the productivity.

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Kartu Prakerja program and better internet access increase the beneficiaries income

Table 2. The Mincer Wage Equation

Variables	(5) OLS	(6) IV
prakerja	**0.156***	**0.176****
	0.0796	**0.081**
bts	**0.073*****	**0.072*****
	0.021	0.021
year of education	0.097***	0.194***
	0.015	0.047
age	0.062**	0.035
	0.028	0.031
age2	-0.001*	-0.000
	0.000	0.000
female	-0.451***	-0.534***
	0.084	0.092
married	-0.064	-0.121
	0.278	0.283
java	0.179**	0.215**
	0.081	0.084
services2021	-0.175	-0.223**
	0.108	0.113
workhrs_2021	0.015***	0.016***
	0.002	0.002
cons	10.60***	9.822***
	0.557	0.660
N	1,223	1,221
R-sq	0.121	0.091

Source: Authors' Calculation
*Standard errors in parentheses: *** p<0.01, ** p<0.05, *p<0.1*
The instruments variable in the IV model is mother's education, instrumented variables is year of schooling.

- Kartu Prakerja program has a **positive impact** on income.
  - It increase income of 15.6-17.6% or around IDR 234,000-264,000, if the average income is IDR1.5 million/month.
- Better internet access has a **positive impact** on income.
  - It increase income of 7% or around IDR 105,000.

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Conclusion and Recommendation

- **Kartu Prakerja program is worth continuing.**
  - Kartu Prakerja beneficiaries have a higher competencies, productivity, competitiveness, and entrepreneurship skills than non-beneficiaries.
- **Better internet access improves competencies, productivity, and competitiveness.**
  - The availability of base transceiver station/BTS (telecommunication tower), which translates into better internet access, has a positive and significant effect on competencies, productivity, and competitiveness.
  - The findings align with some prior research which found that digital infrastructure effectively boost e-learning outcomes (Aldashey & Batkeyey, 2021), and the availability of digital connectivity can help the development of productivity; workers can carry out task more rapidly and produce higher-quality work with better access to internet-based technologies (Hjort & Sacchetto, 2022).
  - Therefore, it is increasingly important to have another BTS development programs in the future. However, further studies are needed to analyze and determine which regions in Indonesia are more effective for developing BTS.
- **Internet access has an insignificant effect on entrepreneurship skills improvement**.
  - The number of entrepreneurs or SMEs in the digital ecosystem is still relatively low, less than 26% of SMEs in Indonesia have been connected to the digital platforms.

THANK YOU VERY MUCH