

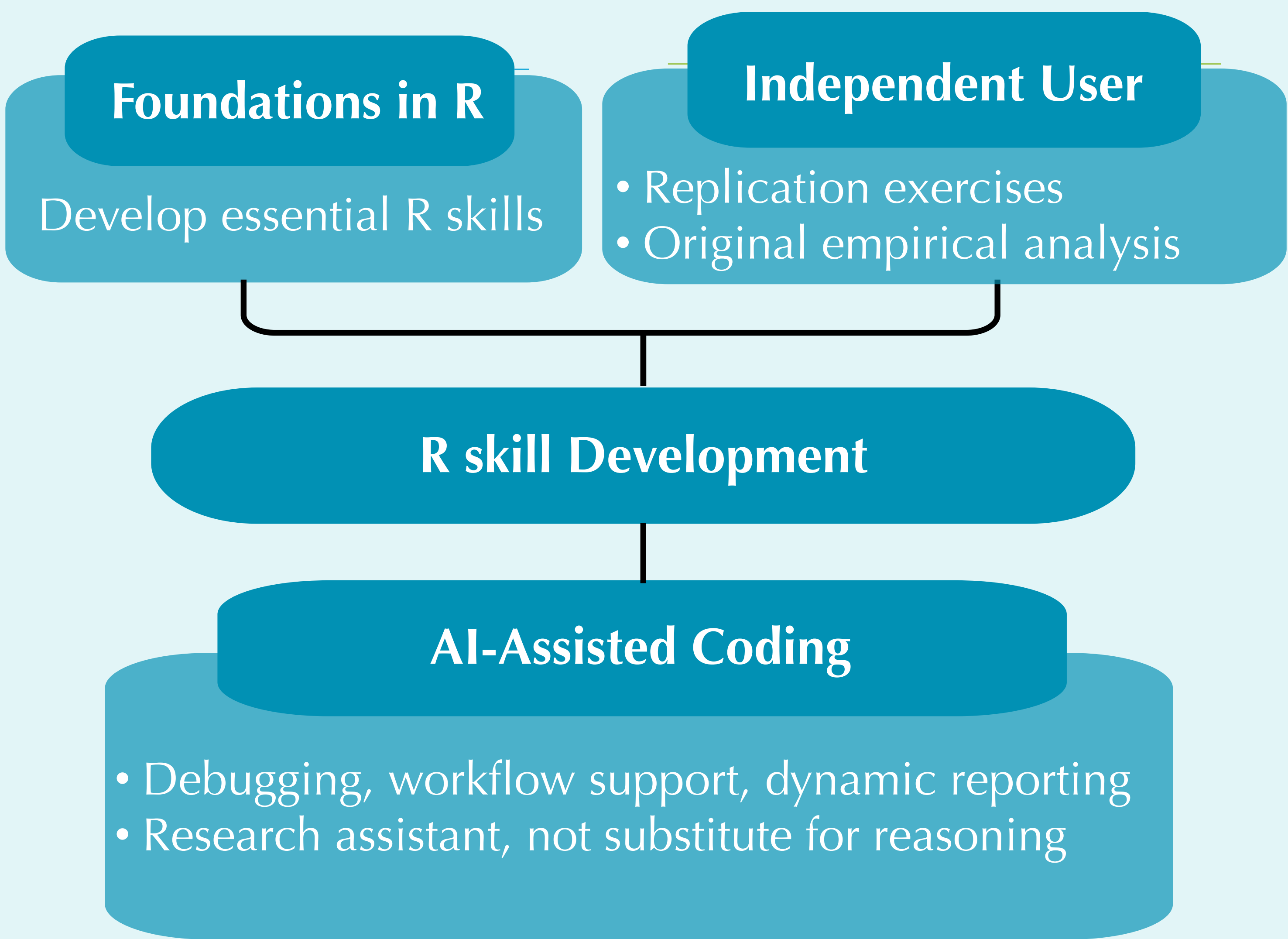
INTEGRATING GENERATIVE AI INTO THE R CODING CURRICULUM FOR AGRICULTURAL ECONOMISTS

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Motivation

- Agricultural economics is increasingly data intensive.
- R is an open-source tool for empirical analysis, visualization, and reproducible research.
- Generative AI can reduce coding barriers, speed up debugging, and support self-learning.
- **Tension:** efficiency gains vs. loss of conceptual understanding

Pedagogical Framework



Curriculum Design: Teaching related to AI

Module: Data Analysis with R in Agricultural Economics (M.Agr.0151)

Learning outcomes: Students learn to use R for data retrieval, management, and analysis, and to independently navigate online resources (packages, documentation). The course equips them with the quantitative toolkit needed for a data-driven thesis.

Course structure: 2 weeks block course

- **Week 1: R Programming:** fundamentals, data management, visualization, coding practices, functions, and reproducible reporting
- **Week 2: Applied Data Analysis:** Panel Data Econometrics, Production and Efficiency Analysis, Impact Evaluation, Agricultural Trade Analysis, Machine Learning
- **Evaluation:** Coding proficiency, conceptual understanding, task completion efficiency
- **Next Session:** October 2026

Data analysis with generative AI

```
Copilot_example.R
1
2 # Load the package for data cleaning
3 library(tidyverse)
4 library(readr)
5 # Load the data
6 df <- read_csv("data/cleaned_data.csv")
7 ## Rescale a variable from 0 to 1:
8 df$a <- (df$a - min(df$a, na.rm = TRUE)) /
9         (max(df$a, na.rm = TRUE) - min(df$a, na.rm = TRUE))
10
11 df$b <- (df$b - min(df$b, na.rm = TRUE)) /
12         (max(df$b, na.rm = TRUE) - min(df$a, na.rm = TRUE))
13
14 # Turn my repeated data-cleaning steps into a reusable R function.(PROMPT)
15 normalize <- function(x) {
16   (x - min(x, na.rm = TRUE)) / (max(x, na.rm = TRUE) - min(x, na.rm = TRUE))
17 }
18 }
19
18:2 (Top Level) Copilot: No completions available. R Script
```

```
Example_Quarto.qmd
Source Visual B I <> Normal Format Insert Table Outline
---
title: "Replicable Research using Quarto"
author: "Dela Fiankor"
format: html
editor: visual
execute:
  echo: true
  warning: false
  cache: true
---

Plots using ggplot()

{r}
#| fig-align: center
#| echo: false
#| out-width: "100%"

library(tidyverse)

mtcars %>%
  mutate(cyl = as.factor(cyl)) %>%
  ggplot(aes(x=wt, y=mpg, color=cyl, shape=cyl)) +
  geom_point() +
  scale_color_brewer(palette="Accent") +
  geom_smooth(method=lm, se=FALSE, fullrange=TRUE) +
  labs(title="Miles per gallon \n according to the weight",
       x="Weight (lb/1000)", y = "Miles/(US) gallon",
       color = "Cylinders",
       shape = "Cylinders")+
  theme_minimal()

(Top Level) Copilot: No completions available. Quarto
```

