**Staffing Gap** S65-5660

**Background:** Goal-gap structures are fairly common generic structures in system dynamics. They represent situations where the amount of activity is a function of the difference between some goal or desired state and the actual state of the system. How fast this gap is closed is captured by the time constant or fractional rate (the time constants and fractional rates are reciprocals). A common example of a goal-gap structure in health, social work, public health, etc. is the difference between the desired level of staff and the current level of staff where this is a constant rate of turnover.

**Purpose:** To develop skills in using Stella to rebuild generic structures from a list of equations.

**Instructions:**

1. Rebuild the model and graph shown below in Stella and replicate the simulation runs.
2. **Why does the staffing gap never reach zero?** Because the staff is never going to be equal to the staffing goal since we have people turning over and this decreases the level of staff which never gets to reach the quantity of staffing goal, this considering as well that we have a delay on the time it takes to hire new people.





Average\_time\_to\_hire = 2

UNITS: Months

Staff(t) = Staff(t - dt) + (Hiring - Turnover) \* dt

INIT Staff = 10

UNITS: Employees

DOCUMENT: Number of staff.

INFLOWS:

Hiring = Staffing\_gap/Average\_time\_to\_hire

UNITS: Employees/Months

DOCUMENT: Hiring rate.

OUTFLOWS:

Turnover = Turnover\_fraction\* Staff

UNITS: Employees/Months

DOCUMENT: Staff turnover.

Staffing\_gap = Staffing\_goal-Staff

UNITS: Employees

DOCUMENT: Number of FTEs needed.

Staffing\_goal = 10+STEP(5, 2)

UNITS: Employees

DOCUMENT: Staffing goal.

Turnover\_fraction = .1

UNITS: Dimensionless/Months

DOCUMENT: Staff turnover fraction.

{ The model has 7 (7) variables (array expansion in parens).

In root model and 0 additional modules with 0 sectors.

Stocks: 1 (1) Flows: 2 (2) Converters: 4 (4)

Constants: 2 (2) Equations: 4 (4) Graphicals: 0 (0)

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