82. We note that $n = 100\,\text{turns/cm} = 10000\,\text{turns/m}$. The induced emf is

$$\begin{aligned}
\mathcal{E} &= -\frac{d\Phi_B}{dt} = -\frac{d(BA)}{dt} = -A\frac{d}{dt}\left(\mu_0 n i\right) = -\mu_0 n\pi r^2 \frac{di}{dt} \\
&= -(4\pi \times 10^{-7}\,\text{T}\cdot\text{m/A})(10000\,\text{turn/m})(\pi)(25 \times 10^{-3}\,\text{m})^2 \left(\frac{0.50\,\text{A} - 1.0\,\text{A}}{10 \times 10^{-3}\,\text{s}}\right) \\
&= 1.2 \times 10^{-3}\ \text{V} .
\end{aligned}$$

Note that since $\vec{B}$ only appears inside the solenoid, the area A is be the cross-sectional area of the solenoid, not the (larger) loop.