θ
x
$\dot{x} + L\dot{\theta}$
$x\dot{\theta}$
(m, L)
M

Let mass of bob be M.
The speed of the bob is $v = \sqrt{\left(\dot{x} + L\dot{\theta}\right)^2 + \left(x\dot{\theta}\right)^2}$
The total angular momentum of the system is $m\frac{L^2}{3}\dot{\theta} + Mv\left(\sqrt{L^2 + x^2}\right)$