b)

2.1

a)

This is the non-treated potential outcome for everybody in this group.

b)

$$Y_i(0)ID_i = 1$$

Is the untreated potential outcome that would be treated under a hypothetical situation of people who would be treated.

$$Y_i(0)Id_i = 1$$

Is the untreated potential outcome for the subject I, who empirically has been treated

c)

$Y_i(0)$ Is the untreated outcome for subject *i*

$Y_i(0)ID_i = 0$ - Is the untreated potential outcome for *i* who under a hypothetical allocation of treatment would not be treated

d)

The contrast of the meaning between $Y_i(0)ID_i = 1$ and $Y_i(0)ID_i = 0$ is that the latter is observable and the first wouldn't be, even though they are both hypothetical situation for subject *i* in an untreated scenario.

e)

$E[\ Y_i(0)]$ Expected untreated potential outcome for subject *i.* Could be calculated by the average value from the subjects.

$E[\ Y_i(0)ID_i = 1]$Expected untreated potential outcome for subject *i* under dome hypothetical allocation of treatment would be treated.

f)

The randomly assigning of groups will ensure that both groups will have the same potential outcome to both treatments. Therefore, the selection bias will be 0 when D_i is randomly assigned, cause the two groups will be alike.

2.10

a)

If the treated subjects know they are being treated and for what purpose, they might not only read the treatment (newspaper), but would supposedly also seek other information about politics, and would increase their interest in politics more than just from the newspaper. Therefore, the two groups wouldn't be equal: $E[\ e_{i1}ID_i = 1] \neq E[\ e_{i0}ID_i = 0]$

On another note: It would be hard to exclude other explanations of the effect of Y, so we can't make sure or X is the right one, when we see the estimates of the effect.

b)
If the students bring their newspapers to the cafeteria that might interfere with the control group, who also would be able to read the newspaper, which might jeopardize the results and we might underestimate the results.

2.12

a)
In this research we can't expect the treatment and the control groups potential outcomes will be the same, since we don't know if the selection of groups is based on randomness.
The problem is that the prisoners have self-selected into treatment and there is a problem with that the treatment group who reads are already better readers than the control group.
It violates the assumption that the treatment is uncorrelated with the effect.

b)
It is hard for us to know if it is that prisoners reading in itself which has an effect on their behavior, or it is a lot of other factors which will be derived from how this group is treated, as they will have less interference with prisoners staff and other prisoners.

c)
There could be a problem with the assumption of non-interference, if the subjects are aware of the treatments that other subject receive, with could have an effect. But most importantly it could be that the treatment would be transmitted from the treated to the non-treated.

d)