Annex A

SAMPLING INFORMATION

The decision to impute plausible values on the CBAS scale for students in CBAS participating schools that participated only in PISA paper-and-pencil test was made by data analysts of the Consortium (Westat and ACER). The quality of imputing missing values was evaluated and the ISL CBAS situation approximated as closely as possible: effective sample size = 400, correlation between SCIE and CBAS r=0.9, correlation between probability to respond and CBAS performance p = 0.1 (it is low, because for most students the non-response is random, so for that group p = 0) and non-response rate = 0.8. In the following simulation, only scores on one other dimension are used (therefore background information, reading and mathematics performance are not taken into account). The results of this imputation are in the following table:

ARGUMENTS	CBAS mean of respondents only	S.E. resp	True mean CBAS	S.E. true	Mean CBAS after imputation	S.E. impute	DIFF (true-impute)	S.E. DIFF
N=400, r=0.9, p=0.1, NR=0.8	**0.08**	0.106	**0.01**	0.049	**0.00**	0.073	0.01	0.054

As the above table shows, the mean after imputation is much closer to the true mean (and not significantly different) than the mean of the 20% respondents, even with such a low p-value. The bias of the 20% of the students will be bigger is we increase p to 0.2, while the mean after imputation is still the same as the true mean:

ARGUMENTS	CBAS mean of respondents only	S.E. resp	True mean CBAS	S.E. true	Mean CBAS after imputation	S.E. impute	DIFF (true-impute)	S.E. DIFF
N=400, r=0.9, p=0.2, NR=0.8	**0.28**	0.103	**0.01**	0.049	**0.01**	0.073	0.00	0.055

Here, the CBAS mean of the 20% respondents is significantly different from 0, while the true mean is not and neither is the mean after imputation.