

OVERVIEW OF CoE ITEMS FROM EXPLORATIVE STUDY

APPENDIX B

The table on the next page was used to score the judgements of the students and teachers in the explorative study (see Chapter 2). The list consists of 47 different items. For the purpose of the data analysis, the items were categorised as validity, reliability and accuracy. The items which were recognisable in the student-written article are separated from the items that were neglected in the student-written article. Item 17 *'Results have not been interpreted by the students who did the experiments'* was removed from the list during the data analysis, as this item was considered to reflect communication about an inquiry more than students' procedural understanding.

Recognisable in the student-written article	Neglected in the student-written article
Validity	
<ul style="list-style-type: none"> ▶ Summary of the inquiry as described in the article ▶ Logical reasoning in theoretical framework ▶ Relation of theoretical framework to other parts of the inquiry ▶ Validity of inquiry goal [blood pressure] ▶ Validity of inquiry goal [pupil dilation] ▶ Quality of inquiry question ▶ Stating of features to be observed [blood pressure, pupil dilation] ▶ Relation between experimental procedure and inquiry question ▶ Tables and graphs with appropriate headings and captions ▶ Tables and graphs to sum up the results ▶ Use of results to found the conclusion ▶ Conclusion that matches the inquiry question ▶ Conclusion that is restricted to the evidence of the inquiry ▶ References that fit with the inquiry 	<ul style="list-style-type: none"> ▶ Refer to literature ▶ Specify the inquiry question with operational questions ▶ Give a hypothesis about intended inquiry ▶ Give a prediction about intended inquiry ▶ Make a graph of the results of the inquiry [pupil dilation] ▶ Name the type of relation [causal, correlation, functional] ▶ Evaluate the validity of the conclusion ▶ Evaluate reliability results [blood pressure] ▶ Give recommendations for further inquiries

Recognisable in the student-written article	Neglected in the student-written article
Reliability	
<ul style="list-style-type: none"> ▶ Control experiment/blank [blood pressure] ▶ Evaluation of the reliability of the inquiry ▶ Consistency of conclusion with similar inquiries of other researchers ▶ Quality of references 	<ul style="list-style-type: none"> ▶ Set apart the independent variable and dependent variable ▶ Perform a control experiment/blank [pupil dilation] ▶ Describe the expected influence of measurements on the outcome ▶ Keep other influencing variables constant ▶ Justify the sample size and its representativeness ▶ Describe the influence of measurements on outcome ▶ Repeat measurements, calculate average and deviation ▶ Compare results with results of other experiments

Recognisable in the student-written article	Neglected in the student-written article
Accuracy	
<ul style="list-style-type: none"> ▶ Calculation of the amount of chocolate/cacao [control variable] ▶ Intervals of the independent variables ▶ Range of the independent variables ▶ Range and intervals of the instruments ▶ Scale distribution in the graphs ▶ Evaluation of accuracy of measurements [pupil dilation] 	<ul style="list-style-type: none"> ▶ Describe the appropriate sensitivity and range of instruments ▶ Describe expected spread of the dependent variable ▶ Calculate average values, deviation and statistical significance ▶ Indicate possible outliers ▶ Describe possible influence of human errors on measuring values ▶ Evaluate the accuracy of measurements [blood pressure]