

PILOT STUDY

STUDENTS' INTEREST IN THE SUBJECTS OF INQUIRY TASKS IN THE THREE INQUIRY UNITS

APPENDIX D

METHOD

Participants

The participants in the pilot study were 24 pre-university science students (aged 16 or 17) from an upper secondary school in the Netherlands. The students all studied biology, physics and chemistry at pre-university level. They were used to doing practical work in their regular science classes, but had no experience yet in self-evaluating accuracy, reliability and validity during the enactment of an inquiry.

Materials and procedure

In twelve pairs, the students conducted three successive inquiry units in general science, biology and physics in which the set of rubrics was implemented. Each inquiry unit was composed of three parts and each part was performed during an after-school period of 160 minutes; so that each of the activities took a total of three times 160 minutes in one school year. All student pairs designed and performed inquiries in a general science, biology and physics inquiry unit. In the general science unit, the inquiry task was about the cooling rate of coffee, in the biology unit on human taste and in the physics unit on the traffic situation on a dangerous crossing.

Data collection and data analysis

After each inquiry unit, all students individually filled out a questionnaire with two questions. These were two closed questions with a five-point Likert scale. A score of 1 on the Likert scale was explained to the students as 'I totally disagree' and a score of 5 as 'I totally agree'. The questions in the questionnaire were: (1) *[subject of inquiry task]* was an interesting subject for designing an inquiry, and (2) *[subject of inquiry task]* was an interesting subject for performing an inquiry.

Five students were interviewed after each inquiry unit and were asked each time two open-ended questions: (1) *[topic of inquiry task]* was an interesting topic for designing an inquiry, and (2) *[topic of inquiry task]* was an interesting topic for performing an inquiry.

The students' responses in the interviews were categorised as:

- 1) Inquiry topic is interesting to design/perform an inquiry
- 2) Inquiry topic is partly interesting to design/perform an inquiry
- 3) Inquiry topic is not interesting to design/perform an inquiry
- 4) No or ambiguous answer

When a student gave more than one answer, all answers were categorised separately. All data from the interviews was independently categorised by two researchers, with an overall proportion agreement of 93%. All differences between the data analyses of both researchers were discussed until consensus was reached (Janesick, 2000).

RESULTS

Questionnaires

After the general science unit with the cooling coffee inquiry task, all 24 students filled out the questionnaire. After the biology unit about the human taste inquiry task and the physics unit with the traffic situation task, 22 and 23 students respectively filled out the questionnaire.

The students' responses and the average scores are given below.

	Scores on designing inquiry about														
	cooling coffee					human taste					traffic situation				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Number of students	2	1	3	6	12	1	1	1	9	10	0	3	0	8	12
Percentage of students	8	4	13	25	50	5	5	5	40	45	0	13	0	35	52

	Scores on performing inquiry about														
	cooling coffee					human taste					traffic situation				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Number of students	0	0	2	6	16	1	1	2	9	9	0	0	2	8	13
Percentage of students	0	0	8	25	67	5	5	10	40	40	0	0	9	35	56

Interviews

In the interviews, a total of 43 responses were given by the five students. The scores of the students' responses per question and per inquiry unit are given below.

Question about *designing* an inquiry

Score category	Number and percentage of responses		
	cooling coffee	human taste	traffic situation
1) Interesting	5 (71%)	4 (66%)	6 (86%)
2) Partly interesting	2 (29%)	1 (17%)	1 (14%)
3) Not interesting	0 (0%)	1 (17%)	0 (0%)
4) No or ambiguous answer	0 (0%)	0 (0%)	0 (0%)

Question about *performing* an inquiry

Score category	Number and percentage of responses		
	cooling coffee	human taste	traffic situation
1) Interesting	6 (75%)	5 (56%)	5 (83%)
2) Partly interesting	2 (25%)	3 (33%)	1 (17%)
3) Not interesting	0 (0%)	0 (0%)	0 (0%)
4) No or ambiguous answer	0 (0%)	1 (11%)	0 (0%)

CONCLUSION

From the results it can be concluded that the students experienced the cooling coffee inquiry and traffic situation inquiry as (partly) interesting, with a few exceptions. The inquiry about human taste needs some revisions to make it interesting for all students.