Test of Science Related Attitudes (TORSA)

Instrument Name: Test of Science Related Attitudes (TORSA)

Scale/Subscale Name: Attitude towards science

Source: http://www.pearweb.org/atis/tools/13

Developers: Fraser (1978), School of Education, Macquarie University, North Ryde, NSW, 2113, Australia

Year: 1978, (1981 current version)

Target Audience(s): Middle School and High School students

Language other than English available: Not available, however TORSA is utilized in many countries, suggesting that the TORSA is available in other languages

Type: Attitude

Data collected: Quantitative

Data collection format: 70, 5-pt Likert scale items; self-report; pre/post

Reading Level: Flesch-Kincaid grade level: 8.5

Existence of test/technical manuals, user guides, supplemental materials: Handbook available (Fraser, 1981)

Level of training necessary for administration/scoring/interpretation: None necessary for administration. Basic understanding of statistical methods for scoring

Widespread Use/Professional Endorsements: TORSA listed on the Pearweb.org, "Assessment Tools in Informal Science (ATIS)" website; TOSRA has been widely used in science education research (Lang, Wong, & Fraser, 2005; Cheung, 2009)

Cost of Use: No cost is associated with the use of this survey; Fraser requests that comments and validation data be sent to the author (School of Education, Macquarie University, North Ryde, NSW, 2113, Australia)

Description:

- The TORSA was developed to measure seven science-related attitude scales: social implications of science, normality of scientists, attitude toward scientific inquiry, adoption of scientific attitudes, enjoyment of science lessons, leisure interest in science, & career interest in science.

- The TOSRA has been extensively field tested and is commonly used in science education research and evaluation.
- Scores are meant to be interpreted only at the scale level, not as a whole instrument.
- 10 items

Psychometrics:
Information on reliability and validity are provided below. If information on a particular psychometric was not found, it is indicated as "no information provided." It should be noted that this is not necessarily an indication of a lack of reliability or validity within a particular scale/instrument, but rather a lack of rigorous testing, for various reasons, by the developers or other researchers.

Reliability: *A correlation of at least .80 is suggested for at least one type of reliability as evidence; however, standards range from .5 to .9 depending on the intended use and context for the instrument*

Internal Consistency: .82; has been shown to be highly reliable over time; scale reliabilities (year 10 sample): .82, attitude toward scientific inquiry, .67
Inter-rater reliability: No information provided
Test-Retest: From Years 8 and 9 samples (238 students): .78 (mean of scales); attitude toward scientific inquiry, .75

Validity: ***The extent a measure captures what it is intended to measure.***

Content/Face Validity: Extensive empirical validation, sound theoretical basis
Criterion Validity: No information provided
Construct Validity: Discriminant validity (mean correlations with other scales): attitude toward scientific inquiry, .33, (Fraser, 1978, 1981) found seven unique factors, however subsequent analyses suggest possibility of fewer unique factors (Cheung, 2009)

References:

Cheung, D. (2009). Developing a Scale to Measure Students' Attitudes toward Chemistry Lessons. *International Journal of Science Education*, *31*(16), 2185-2203.

Fraser, B.L. (1978). Development of a test of science-related attitudes. Science Education, 62, 509-515.

Fraser, B.J. (1981). *Test of science-related attitudes (TOSRA) handbook.* Melbourne: Australian Council for Educational Research.

Lang, Q. C., Wong, A. F. L., & Fraser, B. J. (2005). Student perceptions of chemistry laboratory learning environments, student–teacher interactions and attitudes in secondary school gifted education classes in Singapore. *Research in Science Education, 35,* 299–321.

Construct: Science - Attitudes

Scale Name: Attitude towards science as a discipline

Developers: Fraser

Directions:
This test contains a number of statements about science. You will be asked what you think about these statements. There are no "right" or "wrong" answers. Your opinion is what is wanted. For each statement, draw a circle around the specific numeric value corresponding to how you feel about each statement.
Please circle only ONE value per statement.

Rating Scale:

1 = Strongly Disagree (SD)
2 = Disagree (D)
3 = Uncertain (U)
4 = Agree (A)
5 = Strongly Agree (SA)

Items:

1. I enjoy reading about things that disagree with my previous ideas.
2. I dislike repeating experiments to check that I get the same results. (R)
3. I am curious about the world in which we live.
4. Finding out about new things is unimportant.(R)
5. I like to listen to people whose opinions are different from mine.
6. I find it boring to hear about new ideas.(R)
7. In science experiments, I like to use new methods which I have not used before.
8. I am unwilling to change my ideas when evidence shows that the ideas are poor.(R)
9. In science experiments, I report unexpected results as well as expected ones.
10. I dislike other peoples' opinions.(R)

Scoring:

- Reverse scoring (5=strongly disagree to 1=strongly agree) for items indicated with a (R).
- Omitted items are given a score of 3.
- Sum all item ratings together and subtract by 10. Range of scores= 0 to 40.
- Higher scores indicate better attitudes toward science.