Selection of appropriate instruments/Validation of the Instrument

It is important to ensure that instruments measures what they are designed to measure. In social science research it means validating instrument designed for data collection to ensure that it measures what it is designed to measure. The initial draft of the instrument (usually questionnaire or check list of items) is usually given to a panel of experts in the field of study for face validation. Following a series of validation stages, there may be a need for the modification of the instrument prior to pilot testing. When a test instrument is used, there may be a need for establishing the content validity of the instrument. After the validation of the instrument, it is pilot-tested on a similar but smaller sample. The essence of the pilot testing is to find out how the respondents will react to the instrument. After the pilot testing there may be a need for the modification of the instrument. Investigator in social sciences must report how he validated and pilot-tested his research instrument. Applied natural Scientists often use pre-designed standardised physical instruments with established precision consistencies. Such instruments only requires simple calibration before use but adequate training is necessary for competence and skills in the use of such instruments.

Reliability of the Instrument The reliability of an instrument or a test is the degree to which a test or an instrument is consistent in measuring whatever it purports to measure. In other words, it is the degree to which the test or the instrument measures the same thing after time and item after item. The index of reliability is usually expressed as a coefficient reflecting the extent to which a test is free of error variance. The error of variance can be defined as the sum effect of the chance difference between persons which arises from factors that are associated with a particular measurement. The closer a reliability coefficient is to the value of 1.00 the more reliable the instrument hence the more reliable the test is free from error variance. Researchers use different method to

establish the reliability of their instruments depending on the type of data collected.

Administration of the Instrument Investigators are expected to describe briefly how

the instrument was administered on the respondents- whether personally or by mail. In the case of questionnaire, the researcher should specify the number of copies of the questionnaire distributed and the number returned hence the percentage return.

Scoring of the Instrument. This section could be integrated into the next-method of data

analysis, as it is merely concerned with how the data was organized. For example,

indicate that the frequencies of the responses were worked out and the percentages

calculated. Where rating scales are used, indicate the ratings examples as four-point scale

and Likert-type scales.

Examples of scoring methods is provided below:

(a) Strongly agree: Agree: Disagree Strongly Disagree

(b) Very satisfied: Satisfied: Moderately Satisfied: Dissatisfied

(c) Very adequate: minimally Adequate: Inadequate

(d) Very important: important: Somewhat Important: Not Important

(e) Outstanding: Very good: Good: Fair: Poor

(f) To a very great extent: To a good extent: To a Moderate extent: To a poor extent: To a

poor extent.

Likert scales are five-point scales with the middle scale being a condition of neutrality.

Example, Strongly Agree, Agree, Undecided, Disagree, Strongly Disagree. Because the use of undecided creates a problem in research as the position or stand of respondent on the issue is not clear, researchers should avoid using it. Where rating scales are used, under this section, the numerical values assigned to the ratings must be indicted.

Example:

Strongly Agree 4

Agree 3

Disagree 2

Strongly Disagree 1

Mention must be made at this stage of any special features involved in scoring the responses. For Example, in some situations, negative and positive statements are made on the same issue and are rated using the same rating scale.

An example is given below.

Rate the following statements on your attitude to Home economics along the rating scales – Strongly Agree, Agree, Disagree, Strongly Disagree.

STATEMENTS

RATING

STRONGLY

AGREE

AGREE DISAGREE STRONGLY

DISAGREE

1. I love FSM 207

2. I wish FSM 207 is

not included in

Foodservice and

□

□

Note that the first statement is positive and the second negative. In collating the data, the rating, 4,3,2,1, for strongly agree, Agree, Disagree and strongly Disagree are adopted for No. 1 question. If a respondent ticks agree, the score is 3. For number 2 statement which is negatively framed, the scoring will be reversed to convert the statement to positive. Thus Agree as indicated becomes disfavour for FSM 207 which is Disagreement and therefore, the numerical rating is 2. In reporting, statements that were reversed during scoring should be

identified.

Investigators should endeavour to use appropriate rating scale. It is not appropriate to answer research questions that relate to “extent” with a rating scale dealing with “agreement /disagreement”. To measure extent, descriptions indicating the degree of extent should be employed. Other rating scales used in social sciences are the Equal Appearing Interval Scale or the Thurstone scale, the cumulative scale or Guttman scale and Endorsement scales.