Steps in establishing reliability and validity of need assessment questionnaire on life skill training for adolescents

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ABSTRACT

In order to have confidence in the results of a study, one must be assured that the questionnaire consistently measures what it purports to measure when properly administered. In short, the questionnaire must be both valid and reliable. This research paper will comprehensively explore and describes the validity and reliability of a developed research instrument (with special reference to questionnaire) developed for assessing, need of life skill education for adolescents in government schools of Udham Singh Nagar. During pretesting, reliability and validity of the Developed instrument which was in the form of questionnaire, was determined and scale was found highly reliable and valid. Reliability of the instrument was determined by using test retest reliability and split half method. Reliability coefficient was obtained by correlating first and second time administered scores. The test was found highly reliable as the reliability coefficient of the instrument was r=0.96. For split half method the coefficient between the two sets of scores obtained by Spearman Brown formula was found to be highly significant as the reliability coefficient of the instrument was (r=0.87) at 0.01 level of probability indicating high internal consistency of the developed instrument. Content and face validity method was used for establishing the validity of the instrument and the instrument were found highly valid for use.

Key Words : Adolescents, Assessment questionnaire, Spearman formula

INTRODUCTION

Questionnaires are the most frequently used data collection method in educational and evaluation research. Questionnaires help to gather information on knowledge, attitudes, opinions, behaviors, facts, and other information. Radhakrishna *et al.* (2003) found that 64% researchers used questionnaires in agricultural, Extension education and allied subjects studies.

They also found that a third of the studies reviewed did not report procedures for establishing validity (31%) or reliability (33%). Development of a valid and reliable questionnaire is a must to reduce measurement error. Groves (1987) defines measurement error as the "discrepancy between respondents' attributes and their survey responses".

Development of a valid and reliable questionnaire involves several steps taking considerable time. This paper describes the sequential steps followed in the development and testing of questionnaires for need assessment of adolescents for life skill education in schools.

Questionnaire formation:

This section describes the process which was used for developing and testing questionnaires on life skill training for adolescents and posits five sequential steps involved in developing and testing a questionnaire: research background, questionnaire conceptualization, format and data analysis, and establishing validity and reliability. Systematic development of questionnaires is a must to reduce many measurement errors. Following these five sequential steps was used for questionnaire development and testing to enhance data quality and utilization of research.

Fig. 1 illustrates the five sequential steps involved in questionnaire development and testing. Each step depends on fine tuning and testing of previous steps that must be completed before the next step. A brief description of each of the five steps follows Fig. 1.

## Step 1- Collecting background information :

In this first step, the purpose, objectives, research questions, and hypothesis of the proposed research are to be established. Determining the audience, their background, especially their educational/readability levels, access, and the process used to select the respondents (sample vs. population) are also part of this step. Literatures was reviewed on life skill education for adolescents available on internet, books, newspapers, magazines, journals were studied to have thorough understanding of the problem.

Step 2 - Questionnaire conceptualization :

After developing a thorough understanding of the research, the next step was to generate statements/questions for the questionnaire from available literature. These statements should be based on the aim and objectives of our research. In this step, content (from literature/ theoretical framework) was transformed into statements/questions. In addition, a link among the objectives of the study and their translation into content was established. For example, while making questionnaire for checking adolescent knowledge and awareness about HIV AIDS, to understand their need for life skill education which is an important component of life skill education, the researcher must indicate what the questionnaire is measuring, that is, knowledge, attitudes, perceptions, opinions, recalling facts, behavior change, etc. Major variables (independent, dependent) should also identified and defined in this step.

Step 3 - Format and data analysis :

In this step, the focus was given on writing statements/questions, selection of appropriate
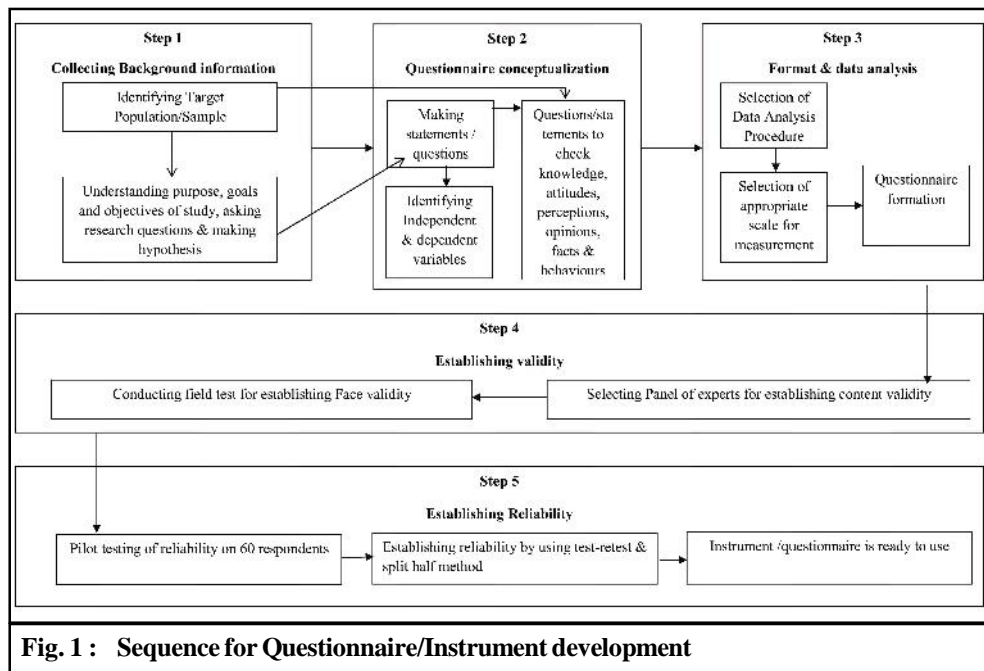
Fig. 1 : Sequence for Questionnaire/Instrument development

scales of measurement (ordinal, nominal, and ratio), format and layout of questionnaire, ordering of questions in questionnaire, font size, and proposed data analysis. Language of the questionnaire should be easily understandable by the study population. Scales are devices used to quantify a subject's response on a particular variable. Understanding the relationship between the level of measurement and the appropriateness of data analysis is important. For example, if ANOVA (analysis of variance) is one mode of data analysis, the independent variable must be measured on a nominal scale with two or more levels (yes, no, not sure), and the dependent variable must be measured on an interval/ratio scale (strongly agree to strongly disagree). Dummy table was to be prepared and statistical tools are finalized to ensure that all the data collected through questionnaire shall be subjected to analysis and inference drawing. Data analysis tool shall be such that all the objectives of research project can be concluded.

Step 4 - Establishing validity :

Validity refers to how well a test measures what it is purported to measure. Validity is the amount of systematic or built-in error in measurement (Norland, 1990). Validity was established using a panel of experts and a field test. As a result of Steps 1-3, a draft questionnaire was ready for establishing validity. Content and concurrent validity method was used for calculating the validity of developed research instrument. The following questions were addressed in Step 4 for establishing validity of the scale :

 – Is the questionnaire valid? In other words, is the questionnaire measuring what it intended to measure?

 – Does it represent the content?

– Is it appropriate for the sample/population?

– Is the questionnaire comprehensive enough to collect all the information needed to address the purpose and goals of the study?

– Does the instrument look like a questionnaire?

Content validity of the scale was obtained by seeking expert advice from 10 experts in the field of Human Development, Food and nutrition, extension education, Clothing and Textiles, Family Resource Management, Social work, Sociology and Psychology and the questionnaire was developed. Their suggestions were incorporated and the schedule was finalized.

The next step was to conduct a field test to establish face validity by using subjects not included in the sample. Make changes, as appropriate, based on both a field test and expert opinion. Now the questionnaire was ready to use.

Step 5 - Establishing reliability :

Reliability is the degree to which an assessment tool produces stable and consistent results. By establishing Reliability we can reduce the chances of random errors in measurement. According to Norland (1990) Reliability indicates the accuracy or precision of the measuring instrument. The pilot test seeks to answer the question; does the questionnaire consistently measure whatever it measures?

In this fifth and final step of establishing reliability of the questionnaire, pilot test was carried out on 60 respondents. Two types of procedures namely test-retest and split half methods were used to find out the reliability of the scale.

Test-retest method:

Test-retest reliability is a measure of reliability obtained by administering the same test twice over a period of time to a group of individuals.   The scores from Time 1 and Time 2 can then be correlated in order to evaluate the test for stability over time (Colin and Julie, 2006).

The scale was administered twice to 60 respondents who were in the range of 13-20 age groups, outside the study area within 6 weeks interval. The calculated test retest reliability for the scale was r=0.96 indicating that the instrument is highly suitable for need assessment of adolescents on life skill training in schools as the scale was stable and dependable in its measurement.

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Split half method:

It is another subtype of internal consistency reliability.   The process of obtaining split-half reliability is begun by "splitting in half" all items of a test that are intended to probe the same area of knowledge in order to form two "sets" of items. The entire test is administered to a group of individuals, the total score for each "set" is computed, and finally the split-half reliability is obtained by determining the correlation between the two total "set" scores (Colin and Julie, 2006).

The scale which was administered to 60 respondents was divided into two levels based on odd and even number of statements and the coefficient of correlations between the two

sets of scores obtained by Spearman Brown formula was found to be highly significant (r=0.87) at 0.01 level of probability indicating high internal consistency of the developed scale. So we can say that the developed scale is highly suitable to check the need of life skill training for adolescents.

Conclusion :

Systematic development of the questionnaire or any research instrument for data collection is important to reduce measurement errors. Well-crafted conceptualization of the content and transformation of the content into questions is very important to minimize measurement error. Careful attention to detail and understanding of the process involved in developing a questionnaire are of immense value to researchers, students, and faculty alike. Not following appropriate and systematic procedures in questionnaire development, testing, and evaluation may undermine the quality and utilization of data (Esposito, 2002). Anyone involved in educational and evaluation research, must, establish reliability and validity of developed research instrument. Quality of research can be enhanced by following above discussed five steps. By determining reliability and validity of developed research instrument which was developed to assess need of life skill education of adolescents of Udham Singh Nagar studying in Government schools these above discussed procedures were followed and developed instrument which was in the form of questionnaire were found highly reliable and valid. So this developed instrument can be used not only in Udham Singh Nagar but any were in India by little bit of modification to check adolescents present knowledge on life skills and its importance to other places.

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