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# How to Design A Questionnaire

**Xiaochun Wu**[1*]

[1] School of Foreign Studies, Yangtze University, Jingzhou, China

## Email Address
1792448262@qq.com (Xiaochun Wu)
*Correspondence: 1792448262@qq.com

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## Abstract:
The questionnaire is one of the most widely used techniques for collecting quantitative data. This article aims to introduce the basic definition and types of questionnaires, difficulties researchers encounter when designing questionnaires, the criteria for a good questionnaire and then, steps and skills of questionnaire design will be presented with a questionnaire sample to help readers understand the design process.

## Keywords:
Questionnaire, Questionnaire Design, Survey Study, Research

## 1. An Introduction to Questionnaire

Moser C. A., a famous British sociologist, once says that social surveys are mostly carried out by questionnaires. A questionnaire is a form used in a survey design that participants in a study complete and return to the researchers [2], a technique for collecting quantitative data, consisting of a series of questions which participants are required to answer [10]. Researchers use questionnaires to obtain information about the participants' thoughts, feelings, attitudes, beliefs, values, perceptions, personalities and behavioral intentions. In other words, researchers try to use questionnaires to measure many different types of features [6].

According to the survey scope, questionnaires can be divided into large-scale social questionnaires and small-scale empirical questionnaires. While in the light of the carrier, questionnaires can consist of paper questionnaires and online questionnaires [5]. Furthermore, there are direct questionnaires and mail questionnaires.

Compared with interviews and observation, questionnaires require less time and less expense. As Wen says, however, questionnaire design is a skill acquired through experience, an art rather than a science [10]. It takes great effort to design a questionnaire of high quality and researchers would meet various obstacles. One of the great predicaments is the lack of theory or scientific principles [4]. Nevertheless, a successful questionnaire survey must be based on adequate theoretical analysis and must be guided by a clear theoretical framework. Moreover, having lower reliability and validity is the common flaw in those questionnaires by researchers especially those without enough experiences. Ignoring the validity may cause the analysis and results to deviate greatly and even lead to wrong conclusions [13]. Another key fact to remember is that the level and quality of operation is a critical factor that determines

the validity of the survey, which includes the influence of researchers [8]. Of course, the difficulties of questionnaire design are far more than these.

Thus, which kind of questionnaire can be regarded as a successful one? What is the criteria for a good questionnaire? Sinclair M. A. claims eight points to be considered: question speciality, language, clarity, leading questions, prestige bias, embarrassing questions, hypothetical questions and impersonal questions [9]. While there are four basic principles according to Xiong : purpose, adaptability, operability and economy [12]. Additionally, Wen suggests that any good questionnaire should at least meet the two criteria: having high internal validity and taking a professional outlook [10]. Having high internal validity means that items in questionnaires must measure the variables researchers really want to investigate. In order to improve the validity, researchers could ask themselves every now and then the questions such as "What does the participant's response to a particular item mean" "Does it have one or multiple interpretations" etc. In fact, there are many principles to follow when designing a high-quality questionnaire, among which, in my opinion, the basic three ones are: operability, reliability and validity. To design a good questionnaire, what researchers need are: to have enough reading first to learn about scientific theories for questionnaire design, to think about details in the questionnaire, to design based on scientific theories, to have a pilot study, and if possible, communicating with someone not responsible for the survey to improve the quality of the questionnaire and so forth. Next, a basic analysis of the process of designing a questionnaire will be given with a questionnaire sample for a language institution.

## 2. How to Design A Questionnaire

How to design a questionnaire? Malhotra N. K. points out that the design of a questionnaire can include these steps: (1) selecting the mode for collecting questionnaire data; (2) specifying what kind of data you intend to collect; (3) determining whether questionnaire items will be processed individually or as categories; (4) deciding the content of individual items; (5) choosing the question structure; (6) selecting the question wording; (7) arranging the questions in proper order; (8) deciding the format of the questionnaire; and (9) pretesting the questionnaire [8]. While Xiong argues that the questionnaire design consist of five steps: conceptual operation, exploratory work, designing the first draft of the questionnaire, trial and revision, and finalizing the draft [12]. Johnson R. B. and Christensen L. put up with fifteen principles of questionnaire design: (1) ensure that questionnaire items match your research objectives; (2) understand your research participants; (3) use natural and familiar language; (4) the written items in the questionnaire should be clear, accurate and relatively short; (5) do not use "loaded questions" or "leading questions"; (6) avoid the problem of dual purpose; (7) avoid double negation; (8) determine whether to use open-ended questions or closed-ended questions; (9) the reaction items of closed problems should be mutually exclusive and exhausted; (10) consider the different types and reaction items that can be used in the closed questionnaire; (11) using multiple items to measure abstract concepts; (12) use many different ways to measure abstract concepts; (13) use reverse wording carefully to prevent the reaction set in the scale; (14) prepare a questionnaire with reasonable organizational and easy structure for participants to use; (15) have a pilot study without exception [6]. Here, loaded question refers to a question that contains a word which itself leads to a positive or negative reaction and may cause a strong emotional response. Leading question is a question whose wording implies an answer.

Based on their principles, I would like to list some key steps in the following discussion with a sample for a language institution-an online questionnaire about adults' foreign language learning needs in Guangzhou City, China.

### *2.1. Deciding the Topic and Selecting the Participants*

The research topic is the focus and direction of the questionnaire design. On the basis of the concrete purposes of the questionnaire survey, references can reduce the blindness of research and improve the effectiveness of questionnaire design [7]. Wen lists five types of information of in her book [10]:

(1) Experience/behaviour (What does a respondent do?);

(2) Opinion (What does a respondent think?);

(3) Feeling (How does a respondent feel?);

(4) Knowledge/abilities (What does a respondent know and what is a respondent able to do?

(5) Background (such as the date of birth, age, gender, marital status)

Take the following sample as an example. This questionnaire aims to understand adults' foreign language learning needs in Tianhe District, Guangzhou City in China to help a language institution to get the current trend of adult foreign language learning demand and better carry out foreign language teaching for customers. Thus the questionnaire belongs to the second type: Opinion (What does a respondent think?). The topic of the sample is clear: an online survey on adult foreign language learning needs as well as the participants: adults in Tianhe District, Guangzhou City in China. More details about participant selection and the types of sample can be seen in the book by Creswell John W. [2].

### *2.2. Deciding the Content and Structure of the Questionnaire*

Firstly, determining whether questionnaire items are processed individually or as categories. For instance, the questionnaire sample is a simple survey. The basic unit in the data analysis is an individual item, which is called an individual-item-based questionnaire. The construction of such a questionnaire is comparatively easy because it does not need to set up categories.

Next come to the questions. Basically there are two types of questions: open-ended questions or unstructured questions versus closed questions or structured questions. Open-ended questions refer to those whose answers are in the participant's own express such as No.16 in the sample. They often begin with "Wh-" such as what, when and why. In closed-questions or structured questions, the researcher provides participants with a set of response alternatives. The closed-question may be multiple-choice (No.6, 9, 10, 12 in the sample), dichotomous (No.2 in the sample), scale choice (No.4, 7, 8, 11 in the sample), simple choice (No.1, 3, 5, 9, 13-15 in the sample) and so on. Also questionnaire items can be studied in various formats such as the examples in Table 1 [1]. Pay attention: use ordinary words so that participants won't misunderstand the content. Good explanations and design will improve response rates [1] such as No. 8 in the sample. Also, decide whether questions are optional or not!

Thirdly, determining the order of questions and the construction of the questionnaire. The construction of questionnaire is of appropriate length and contains an opening beginning with demographic questions, a series of closed-ended questions,

and closing statements [2]. Basically, a complete questionnaire includes six parts: the title, the brief introduction, the explanation of the answer method, the basic information of the participants, the main questions, and the conclusion. You can study based on the sample in the sample.

When compiling the questionnaire, an important strategy is to exert one's empathy ability or empathy ability, that is, to think in the position of potential research participants. For researchers and participants, every item in the questionnaire should be understandable. If a technical term must be used, explain the definition of the term to the research participants. At the same time, try to keep the expression of each topic relatively short because longer topics may confuse the participants or create a sense of stress.

Determine whether to use open-ended questions or closed-ended questions. Open-ended questions enable participants to answer questions in any way they like. Closed-ended questions require participants to choose among the limited options preset by researchers. Questionnaires mainly composed of open questions are called qualitative questionnaires. Questionnaires most composed of closed-ended questions are called quantitative questionnaires. In the quantitative questionnaire, the principle of standardization is very important, and its purpose is to provide the same stimulus to every participant in the study [3]. On top of that, the reaction items of closed problems should be mutually exclusive and exhausted. Examples can be seen in the sample like the item 1, 2, 13 and 15. And finally, consider the different types and reaction items that can be used in the closed questionnaire, such as rating scale, semantic differential, raking and checklist.

***Table 1.*** *Formats of questionnaire items [1].*

| Format | How it looks on a questionnaire | Uses and advantages |
|---|---|---|
| Statements with tick box categories | Please tick the box that best matches your answer<br>Yes☐ No☐<br>Don't know☐ | General attitude measurement. Easily understood and quick to complete. Generates data suitable for non-parametric statistical analysis |
| Rating scales (see Sapsford[3] or Oppenhelm[2] for details of different formats) | Please indicate how you feel about our new surgery opening hours by circling the number that best matches your opinion.<br>Find them convenient Find them inconvenient<br>1 2 3 4 5 | Quantities attitudes on 5 or 7 point scale and differentiates between positive and negative. Good for participants who can conceptualize linear scales and numerical values. Generates data suitable for non-parametric statistical analysis |
| Visual analogue scales | On the line below please draw a cross to indicate how you've reacted to your new medication.<br>Reacted badly Reacted well<br>X | Precise quantification of attitudes. Good for participants who can conceptualize linear scales and have good visual skills. Data must be transformed for statistical analysis. |
| Symbols | The nurse has just given you a lesson in healthy | Similar to numerical rating scale and can be analyzed using similar |

| | | |
|---|---|---|
| | eating. Look at the faces below shows how you feel about the advice you have been given.  | tests but easier to complete for children or those with visual or literacy problems. |
| Open ended items | Do you think exercise and health are linked, and if so, how? Please write your response in the box below. | Allows creative expression but may not suit less forthcoming participants. Must be formally analyzed with qualitative methods. |

### *2.3. Taking a Professional Outlook*

As we mention above, there are paper questionnaires and electronic questionnaires, direct questionnaires and mail questionnaires. Whatever the questionnaire is issued by any way, a professional outlook must be taken.

Electronic questionnaires are easy to design. For instance, the sample is an online one. The researchers use wenjuan.com to design and issue. There are many models available for questionnaire design. As for the mailed questionnaires, remember: contain explicit and simple instructions; be shorter and easier to answer because it is next to impossible to get participants to fill out a mailed questionnaire for one or two hours unless you are prepared to pay well for their time. While paper paper questionnaires should take care: printing should be of high quality —clear and easy to read; avoid stapling papers together if a questionnaire contains more than four pages. Researchers had better to use booklet because booklets do not easily fall apart and allow the use of double-page format for questions.

There are many tips for a professional outlook for questionnaires like: one question and a response category should not be across two pages since split questions may lead participants to think that the question has ended at the end of a page; avoid crowding questions together to make the questionnaire look shorter, overcrowded questions with little blank space between questions can lead to errors in data collection. Actually, they give the impression that the questionnaire is complex and this can result in a lower cooperation and response rate.

To sum up, a questionnaire with a professional look can not only minimize participants' misunderstanding and mistakes, but also increase the response rate. More strategies can be learned from Wolfe D. F. [11].

### *2.4. Conducting a Pilot Study to Test and Improve the Questionnaire*

As a normal practice, a pilot study is one in which a questionnaire is tested on a small sample of participants to detect and overcome potential problems. Fundamentally, no questionnaire could be issued without testing it, not to mention that a questionnaire designed by an experienced researcher can always be improved through the pilot study. Wen (2001) insists that a pilot study must notice: (1) at least 30 cases; (2) timing; (3) monitoring the process; (4) follow-up interviewing (3-5 cases). As a matter of fact, how to conducting a pilot study is based on the needs of the questionnaire. Take the sample as an example. The topic is an online survey on adult foreign language learning needs and the participants are adults in Tianhe District, Guangzhou City, including different occupations. Thus, the researchers must test on

people in different situations like students, entry-level employees and managers. On the basis of participants' feelings about filling in the questionnaire and opinions for improvement, researchers modify the questionnaire to improve its reliability and validity before the final issue of the questionnaire.

A useful method used in the test is called think-aloud technique. It requires participants to express their thoughts and opinions when carrying out an activity. That is to say, in the questionnaire test, the participants are asked to tell some thoughts and opinions about the questionnaire, such as why they choose one of the answers.

**Sample**

An Online Questionnaire Survey on Adults' Foreign Language Learning Needs

The purpose of this survey is to understand your foreign language learning needs, so as to help us understand the current situation of adults' foreign language learning demand in Tianhe District, Guangzhou City and better carry out foreign language teaching. The questionnaire includes 16 questions, which will take you 5-10 minutes to fill in. This questionnaire is anonymous, so please fill in according to your actual situation. Thank you for your cooperation.

1. Gender

☐Male ☐Female

2. Age

☐<18 years old ☐18-25 years old ☐25-35 years old ☐35-45 years old ☐>45years old

3. Current occupation

☐Student ☐Teacher ☐Employee ☐Enterprise manager ☐Freelancer ☐Other:

4. What is the degree of the importance of foreign language learning in your life and work?

☐not important at all

☐not very important

☐no idea

☐important

☐very important

5. If you have the chance, which foreign language would you choose to study?

☐English ☐Japanese ☐Spanish ☐Russian ☐French ☐Other:

6. Why would you choose to learn this foreign language?

☐Personal preferences ☐Learning needs ☐Work needs

☐Tourism needs ☐Migration needs ☐Other:

7. How often would you use this foreign language in your daily life and work?

☐Very low ☐Low ☐Medium ☐High ☐Extremely high

8. What is your self-evaluation of the comprehensive level of your foreign language?

☐Elementary (meeting the needs of simple communication such as greeting)

☐Intermediate (meeting the needs of daily life communication)

☐ Advanced (meeting the needs of living abroad and conduct in-depth and extensive exchanges)

☐uncertainty

9. What skills do you think are insufficient in your current foreign language?

☐Listening ☐Speaking ☐Reading ☐Translating ☐Writing

10. What is the biggest difficulty you encounter in learning a foreign language?

☐Lack of a good language environment for English learning

☐Lack of interest and enthusiasm in learning English

☐Lack of teachers' active guidance

☐Other:

11. What is your opinion on "applying for a foreign language training course is conducive to better mastering a foreign language"?

☐Agree very much ☐Agree ☐Uncertain ☐Disagree ☐Disagree very differently

12. What is the best way for you to learn a foreign language?

☐Online non-interactive courses ☐Online interactive courses

☐Offline centralized ☐training Offline one-on-one training

☐English club ☐Other:

13. What do you think is the suitable capacity for foreign language classes?

☐5 persons ☐6-10 persons ☐11-15 persons ☐15-20 persons ☐>20 persons

14. How long would you like to spend in mastering this foreign language?

☐3 months ☐6 months ☐1 year ☐2 years ☐Other:

15. How much money would you like to spend a year in learning a foreign language?

☐<1000 yuan ☐1000-2000 yuan ☐2000-3000 yuan ☐3000-4000 yuan ☐>4000 yuan

16. Do you have any other supplements to this questionnaire?

## 3. Conclusions

This article presents the method of questionnaire survey from the aspects of definition, type, difficulties when designing questionnaire, criteria for a good questionnaire and design steps, hoping to provide support for designing the questionnaire scientifically. The questionnaire survey not only has outstanding advantages such as saving money and time, being effective, but also has disadvantages such as the reliability and validity in questionnaire design. Researchers should design appropriate questionnaires according to specific research purposes and scientific theories. Questionnaire design is an art acquired through experience, thus, It takes a lot of practice to have good questionnaire works.

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The author declares that there is no conflict of interest regarding the publication of this article.

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