**Operational Definitions and Congruent Evaluation by Saman Asawapoom[[1]](#footnote-1)**

Revision English version by Saman Asawapoom[[2]](#footnote-2) (2023)

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**Abstract**: Operational definitions of technical terms are similar to cameras’ lens. The more quality of lens, the better quality of the pictures. While the quality of researches depend on operational definitions whether they cover all the variables understudied and well defined or not. Researches should understand and make use of the operational definitions, especially in writing a good research questionnaire, and reassuring the research results related to research problems. Moreover, the research problem the research results are theoretical-based, which leads to better research conclusion, dissertation, discussion, and application. The objectives of this article are to conceptualize operational definitions and validate content of research tools.

This article aims to suggest how operation should be written and how congruent index should be done.

**Introduction**

Two important quality indexes of research instruments are validity and reliability (Ary and other, 2006). This article focuses on only the validity using congruent index, which is one the useful content validity methods to assure that the research instrument measure what intend to measure. For example, if you want to weigh something you should use a weighing machine, not a ruler. On the other hand is the reliability, which is an index that tell you whether the research tool is reliable, meaning the measuring tool will give you the same result in all time you measure.

**Understanding of Validity**

When mentioning of validity, it might means many things, such as population validity, research method validity, validity of data collection, or research validity (Gall, Gall, and Borg, 2007). Validity mentioned in this article is instrument validity, which might refers to many concepts. However, the validity mentioned often is Face Validity (Cozy, 2007). The concept of this validity is the whether the research observations or questionnaire question items are congruent with research operation definitions.

One way to find out whether your observations or questionnaire question items have face validity is to ask experts to evaluate your observation tools or questionnaire question items. A direct method is to ask experts to look at your research instrument and judge whether or not it is valid. This method might reassure the researchers to some extent, but depending highly on the expert judgement. My recommended method is a systematic method of congruent index. The method consists of three main parts, namely the operational definitions, the questionnaire question items, and the expert evaluation form.

**The Operational Definitions**

All researchers are aware of the importance of operational definitions used in conducting the research, but some do not play attention on the role of operational definitions on writing questionnaire question items. To me, it is the most import procedure of conducting the research for it signifies whether or not the questionnaire question items are congruent with the operational definitions, which is the validity of the research instrument. The congruent index of the questionnaire question items results from how the experts evaluate whether or not the questionnaire question items are congruent with each operational definition the questions designed for. However, if the operational definition is not well and covered all variables supposed to be measured, the congruent index means very little. So the first thing the research must do is to define the coverage operational definition.

**Concepts and Research Variables**

The aims of all researches are to find out the relationship between or among interested variables of interested research problems (Sullivan, 2001). The research variables are derived from the concepts of components compiled as theories or principles that the researchers believe to answers to the research problems. That is why related literature review is an important part in conducting a research, before, during, and after carrying out research activities. A concept, as Kerlinger and Lee (2000) defined as abstract essences derived from phenomena which reflect similar characteristics, such as weight which reflects varieties of characters from light to heavy. The different characters of the same concept are variables of that thing, such as young, middle age, and old age, which are variables of ages. In conducting a research, firstly, the researchers must identify main variables of the research problem, which forms the title or the topic of the research. And in reviewing the related literature, the researchers must intensively review the main research variables until the researchers understand the main research variables clearly and cover all constituted sub-variables. The concepts obtained from reviewing literature will be very useful in defining operational definitions, and the rest of research.

**Concepts and Operational Definitions**

If the main variables have been clearly reviewed, the concept of the main variables should be clearly defined as well. However, the researchers need to redefine the main variable in ‘operational definition’. For example, from literature review, the main variable as the concept of ‘aggressive’ might mean ‘actions or behaviors that cause troublesome to others’, then the researcher must transfer that concept into operational definition like ‘numbers of time that a child fight with others, or the frequency of a person use electric shot to harm other person’ (Cozy, 2007). However, the operational definition has to be based on related review, but the research can choose representative behaviors or action to include in the operational definition.

I sometimes use the term ‘theoretical definition’ as conceptual definition of the variable under studies. Concept like ‘decentralization’ might be defined as levels and scopes of authority that have be given to the subordinates to decide and act up on.’ When the researcher transfer this conceptual definition into operational definition, the researcher has to choose exact behavior that signifies the concept and scope of matters that decentralized figures have been given authority to prefer. From the conceptual definition of decentralization above, the researcher might define operational definition as ‘ The school directors delegate decision making and implementing the decisions to director assistants on the schools’ tasks of Academic Management, Personnel Management, School Business Management, and General Management’. And the operational definition of Decentralization of Academic Management might be somehow like this: ‘Decentralization of Academic Management refers to the school directors delegate decision making and implementing to director assistants on Academic Management the the following tasks, curriculum development, teaching approaches, educational visual aids, textbooks, instructional supervision, and achievement evaluation.

**Congruent Index Format and Procedure.**

Documents that a researcher should provide to the experts for Congruent Index Evaluation are (1) A short summary of Introduction Chapter, (2) the congruent index evaluation form, and (3) the tentative research questionnaire.

1. A short summary of Introduction Chapter

The researcher should rewrite Introduction Chapter to provide some background and the research design based on Introduction Chapter so that the expert will have some information on your search background and research design in brief.

1. The congruent index form

The congruent index form should include 7 parts (1) The research title, (2) Researcher’s name, and advisors (if any), (3) Directions ( 4) Main Variable Definition Evaluation format, (5) Sub-variable Evaluation format, (6) Open-end Part, and (7) the Evaluator’s Signature, See the example below.

**The Congruent Index Evaluation Form**

**Research Title** : ………………………………………………………………………………………………………………………….

………………………………………..

**Researcher Name**: …………………………………………………………………………………

**Advisor (if any)** : ……………………………………………………………………………………

***Direction:*** This evaluation section consists of 3 parts: Main variable definition evaluation, Sub-variable evaluation, and Open-end part. Please provide observation and recommendation in all three parts according to each direction as follow:

1. Main Variable Definition Evaluation

This research has one main variable. Please evaluate and provide feedback whether the variable is clearly defined and covers all sub-variables thereof. If not, please specify. [In case the research has more main variables, you have to submit all of them for evaluation)

1. Sub-variable evaluation

This research has … sub-variables and each sub-variable will provide the operational definition (on the left handed column), the questionnaire question item in the second column, the evaluation scale in the third column, and the last column is for the expert’s suggestion.

Please evaluate whether or not that the questionnaire question items are congruent to the operational definition provided in the left handed column (the first column), by using these criteria

+ 1 if the questionnaire question item is congruent to the operational definition

1. if you are not sure that the questionnaire question item is congruent or not

-1 if you think the questionnaire question item is not congruent

Open-end part

If you have more suggestions, please provide them in this part

**Main Variable Evaluation**

Main variable of this research is “ …………………………………………………………………………”

The main variable above ( ) covers all sub-variables constitute the attributes of the main variables ( ) does not cover all sub-variables, the additional sub-variable(s) are …………….

**Sub-variable Evaluation**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NO | Operational Definitions | Question items | Evaluation | | | Suggestions |
| +1 | 0 | -1 |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |

Open-end part: Additional suggestions ………………………………………………………………………………………. ………………………………………………………………………………………………….

Evaluator’s signature : ……………………………………………

Name : …………………………………………………………………….

Position : …………………………………………………………………

Date : ……………………………………………………………………..

**An example of A Congruent Evaluation**

**The Congruent Index Evaluation Form**

**Research Title** : The States and Guidelines of Administrational Decentralization in Secondary Schools under the Jurisdiction of Si Sa Ket Primary School Service Area Office 3.

**Researcher Name**: Saman Asawapoom

**Advisor (if any)** : No

***Direction:*** This evaluation section consists of 3 parts: Main variable definition evaluation, Sub-variable evaluation, and Open-end part. Please provide observation and recommendation in all three parts according to each direction as follow:

1. Main Variable Definition Evaluation

This research has one main variable. Please evaluate and provide feedback whether the variable is clearly defined and covers all sub-variables thereof. If not, please specify. [In case the research has more main variables, you have to submit all of them for evaluation)

1. Sub-variable evaluation

This research has … sub-variables and each sub-variable will provide the operational definition (on the left handed column), the questionnaire question item in the second column, the evaluation scale in the third column, and the last column is for the expert’s suggestion.

Please evaluate whether or not that the questionnaire question items are congruent to the operational definition provided in the left handed column (the first column), by using these criteria

+ 1 if the questionnaire question item is congruent to the operational definition

0 if you are not sure that the questionnaire question item is congruent or not

-1 if you think the questionnaire question item is not congruent

Open-end part

If you have more suggestions, please provide them in this part

**Main Variable Evaluation**

Main variable of this research is ***“ Administrational decentralization refers to the degree of which the school directors delegate decision making and task performance on Academic Management, Budgeting Management, General Business Management, and Personnel Management to school Director assistants”.***

The main variable above ( ) covers all sub-variables constitute the attributes of the main variables ( ) does not cover all sub-variables, the additional sub-variable(s) are …………….

**Sub-variable Evaluation**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| NO | Operational Definitions | Question items | evaluation | | | Suggestions |
| +1 | 0 | -1 |
| 1 | Academic Management: the degree of which the school directors delegate decision making and task performance on Curriculum development, assigning teachers on schedules, choosing teaching approaches, books, and materials, supervision, student achievement evaluation, and the development of school academic operation. | * 1. school directors delegate decision making and task performance to director assistant. ………………………….   2. School directors delegate decision making and task performance on curriculum development to director assistants. ………………………..   3. School directors delegate decision making and task performance on teaching schedules to directors assistants………………………….   4. School directors delegate decision and task performance on book budgeting………………………….   5. ……………………………………….. |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |

Open-end part: Additional suggestions ………………………………………………………………………………………. ………………………………………………………………………………………………….

Evaluator’s signature : ……………………………………………

Name : …………………………………………………………………….

Position : …………………………………………………………………

Date : ……………………………………………………………………..

**Note**: From the sample above, the experts should mark items 1.1-1.3 as +1 because the questions items reflex the operational definition, while item 1.4 should be -1 because budgeting decision is not mentioned in the operation definition.

**The Index Calculation**

The Index value of each question item is obtained from the following equation:

The Index of Congruence (IOC) = Summation of evaluation scores obtained from the experts (TSO) divided by Numbers of experts (NE)

IOC = TSO/NE

And the range of IOC should be between -1 to 1 and the acceptable values should be .6 to 1. The recommended numbers of experts are 5 or 10 for the convenient calculation. But that is not a rule.

**The tentative research questionnaire**

The research should enclose the final form of the questionnaire using the questionnaire question items evaluated above so that the experts will get some ideas how the question items will be used. The sample of the questionnaire should be exactly how it is to be used when the researcher gather the data. Although, the questionnaire is not the main purpose of IOC evaluation, but experts might also provide the researcher suggestions on the questionnaire improvement, if they have any.

**Conclusions and Application**

The quality verifications of research instruments are crucial research activities that should be conducted and report. At least two quality index include content validity and reliability. This article focuses on content validity by means of Index of Congruency. The process and method are not only provide the researchers a content validity value, but also provide a clear and meaningful questionnaire item questions to gather relevant data for the research. I hope this simple and practical method will be helpful for graduate students and academics in general.

**References**

Aray, D. and Others. (2006). **Introduction to Research in Education**, 7th ed. Australia: Thomson

Wadsworth.

Gall, M.D., Gall, J.P., P. and Borg, W.R. (2007). **Educational Research: An Introduction**, 8th ed.

Boston: Pearson.

Kerlinger, F.N. and Lee, H.B. (2000). **Foundation of Behavioral Research**, 4th ed. Australia:

Cengage Learning.

McMillan,J.H. and Schumarchr, S. (2010). **Research in Education: Evidence-Based Inquiry**, 7th

ed. Boston: Pearson.

Ministry of Education. (2001). **Technical Terms on Education**. Bangkok: Kuru-Sapa Press.

Saman Asawpoom. (2015). ***Operational Definition and Index of Congruence Evaluation***.

Buabandit Journal of Educational Administration (Vol 15. No. 1} October, 2014-January, 2015).

Sullivan, T.J. (2001). **Method of Social Research.** New York: Harcourt College Publisher.

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1. Th article printed in Buabandit Journal of Educational Administration (Vol 15. No. 1} October, 2014-January, 2015) [↑](#footnote-ref-1)
2. Professor, Dr. , The chairman of Doctoral Degree Program in Educational Education at Si Sa Ket Rajabhat University, Thailand. [↑](#footnote-ref-2)