# Validity Test Study on Effect of Instruments with Classroom Learning Model of Independent Learning among Undergraduate Nursing Students

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Validity and reliability are very important in study instrument as a part of the study. This section is useful to realize the reliability and confidence in results of study. A scale or measuring instrument in a study can be said to have high validity if the instrument is used to examine its own reliability in carrying measuring function, or can provide measurement results in accordance with objective measurement. This study aimed to test validity and reliability of a study instrument in the influence of Flipped Classroom Learning (FCL) Model toward independent learning among undergraduate nursing students. Total population sampling was 30 undergraduate nursing students who followed the FCL Model on their subjects in Mental Health Nursing. Guttmann scale questionnaire form was used, and numbered to 21 statements with choices of 'yes', 'no' and 'free'. Technique of data collection was through a cross-sectional approach. Results of computerized data were processed and analyzed using the Pearson Product Moment Correlation. Test results on the overall validity and reliability of questionnaire's independent learning and critical thinking abilities of items valued and the results were r > 0.33 and had been reliable with Alpha r values > 0.666 by Cronbach's Alpha.931. In conclusion, the instrument is valid thus fulfilling the reliable qualification as a measuring tool fit to use in study.

Keywords: *Flipped Class; independent learning; reliability; study instruments; validity*

## INTRODUCTION

Each researcher hopes to achieve accurate and reliable study. The main criteria for maintaining the accuracy of the results of a research study is by adequately measuring that the instrument meets the criteria which include validity, reliability, and objectivity. Content-related evidence of validity is a central concern during instrument development, whether such development occurs in a study setting, or in the context of professional practice (Berk 1990). The efforts of researchers to process reliability measurement tool are called the study, the validity and reliability. Related to this view,

Carole L. Kimberlin and Almut G. Winterstein (2008) explained that the instruments used in a scientific study must meet the requirements, namely validity, reliability and accuracy.

McLeod (2015) said that a distinction can be made between internal and external validity. These types of validity are relevant in evaluating the validity of a research study and procedure. External validity can be improved by setting experiments in a more natural setting and by using a random sampling to select participants. This means that the instrument has external validity if the criteria in the instrument are based on empirical facts. While internal validity can be improved by controlling extraneous variables, using standardized instructions, counter balancing, and eliminating demand characteristics and investigator effects. An instrument is said to have internal validity if the criteria of the instruments developed are relevant, based on theory, rational, and reflects what is measured.

Expert professional judgment should play an integral part in developing the definition of what is to be measured, such as describing the universe of content, generating or selecting the content sample, and specifying the item format and scoring system. Thus, inferences about content are linked to instrument construction as well as to establishing evidence of validity after [an instrument] has been developed and chosen for use (Berk 1990).

Validity and reliability of a measuring study instrument is important because it affects the quality of the results, decision making and conclusions. The quality of the entire process of data collection since the concept was prepared until the results of data analysis should be accountable. Bolger (2014) said that study results of data analysis were to determine a decision or set of policies in order to solve the problem by the decision maker. The rationale, a study into the best solution can be obtained from data of objective, measurable, and has met the test validity. This type of validity refers to the extent to which a test captures a specific theoretical construct or trait, and it overlaps with some of the other aspects of validity and reliability (McLiod 2013).

Meanwhile, reliability is the consistency of a measurement instrument and assessment (Berk 1990). This means that validity of the characteristics of a test when tested on a group of test-takers. The process of validation of an instrument of study involves two steps, namely data collection phase and a logical argument to indicate exactly a particular conclusion (Kimberlin and Winterstein 2008). Meanwhile, reliability is the consistency of a measurement instrument and assessment. Cornball and Meehl (1955) in McLeod (2013) stated that research instrument is said to be of good quality if it is characterized by high levels of scores regarding the instrument consistencies.

Researchers must understand that success reveals the variables to be measured as such (the objectivity of the results of votes) is highly dependent on the quality assessment tool and on how the

implementation of the measures. Based on this explanation in mind, knowing and understanding the meaning of the validity and reliability in study is crucial.

This study aimed to test the validity and reliability of measuring study instruments on the implications of the Flipped Classroom Learning (FCL) towards independent learning and critical thinking skills among undergraduate nursing students.

## METHOD

The test method on validity and reliability of study instrument in the influence of FCL to independent learning and critical thinking skills among undergraduate nursing students in Banten Province was achieved through two steps, namely content validity of test methods and test validity constructs. This is in line with the opinion of Ronald Alan Berk (2016) that in order to achieve the validity of the test, it needs to involve expert assistance as expert judgment that has done similar study.

It was intended to determine the content validity of the contents of a measuring instrument (materials, topics, substance) whether there had been a representative or not. The validity of the content was fundamentally an opinion, good opinion of themselves or others. The construct validity was an abstraction and generalization of special and concept created specifically for the needs of science and had a limited understanding. This is in line with the opinion of Boudreau, Gefen et al. (2000) that in educational study, especially related to the learning activities used instruments can be considered valid at least if it has met the validity of the content acquired through expert judgment.

The validity of this empirical study instruments had also sought to test the validity of item-total with Pearson Product Moment Correlation. The aim of study was to determine the validity of the item in the 5% significance level if the chance of errors $\leq 0.05$. If it turned out that higher chance of mistakes were provisional, that means the grain instrument was rated to be invalid, so it must be disqualified and should not be used as the material to collect the research data.

## RESULTS

Components/dimensions underpinning method of FCL is a theory Bergmann and Sams (2012), includes three main steps, namely the learning activities before class, during class and after class. Study instrument developed independent learning of the theory of Guglielmino and Guglielmino

(1991). Meanwhile, for the instrument's ability to think critically, a theory was developed by Paul and Elder (2004). The empirical evidence showing whether there was a link between the components or dimensions of the instrument of this study was that this instrument had been used in a previous study by Djajalaksana (2012). To obtain the construct validity of this instrument had been done with the analysis of factors into account, student characteristics and type of subjects, were the results that showed validity with less chance of mistakes ≤0.05. The validity of study instruments also pursued study by consulting an expert study instrument in order to meet the validity of the content obtained through expert judgment.

Validity of empirical study instruments had been conducted through the validity test of the 21-point total with Pearson Product Moment Correlation. Trials to test the validity and reliability tests conducted in the first class of students through total sampling method on 30 respondents, they were the fourth-semester nursing students at X institution in Bandung who took courses in Maternity and gaining methods of FCL.

The result's validity and reliability of the 21 study instruments that measured the effect of FCL Model on independent learning and critical thinking ability showed the following results:

**Table 1. Reliability test results of study instruments number 21 independence study (N = 30 students)**

Reliability Statistics

| Cronbach's Alpha | N of Items |
|---|---|
| .946 | 21 |

**Table 2. Significance analysis of validity and reliability of study instruments number 21 independence study (N = 30 students)**

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|---|
| KB1 | 69.30 | 79.803 | .700 | .943 |
| KB2 | 69.27 | 77.789 | .761 | .941 |
| KB3 | 69.47 | 78.395 | .643 | .943 |
| KB4 | 69.77 | 76.668 | .677 | .943 |
| KB5 | 69.47 | 77.844 | .639 | .943 |
| KB6 | 69.77 | 76.668 | .677 | .943 |

| | | | | |
|---|---|---|---|---|
| KB7 | 70.13 | 79.361 | .633 | .943 |
| KB8 | 69.50 | 80.190 | .593 | .944 |
| KB9 | 69.77 | 76.668 | .677 | .943 |
| KB10 | 69.90 | 81.541 | .619 | .944 |
| KB11 | 69.30 | 79.803 | .700 | .943 |
| KB12 | 69.47 | 78.051 | .673 | .943 |
| KB13 | 69.67 | 78.851 | .566 | .945 |
| KB14 | 69.47 | 78.395 | .643 | .943 |
| KB15 | 69.30 | 79.803 | .700 | .943 |
| KB16 | 69.80 | 78.510 | .585 | .944 |
| KB17 | 69.20 | 77.476 | .840 | .940 |
| KB18 | 69.50 | 80.190 | .593 | .944 |
| KB19 | 69.47 | 78.395 | .643 | .943 |
| KB20 | 69.90 | 81.541 | .619 | .944 |
| KB21 | 69.30 | 79.803 | .700 | .943 |

**Table 3. Reliability test results of study instruments number 21 independence study**

**(N = 30 students)**

| Number of question (Q) | Corrected Item-Total Correlation | Cronbach's Alpha |
|---|---|---|
| Q 1 | .700 | |
| Q 2 | .761 | |
| Q 3 | .643 | |
| Q 4 | .677 | |
| Q 5 | .639 | |
| Q 6 | .677 | |
| Q 7 | .633 | |
| Q 8 | .593 | |
| Q 9 | .677 | |
| Q 10 | .619 | |
| Q 11 | .700 | .946 |
| Q 12 | .673 | |
| Q 13 | .566 | |
| Q 14 | .643 | |
| Q 15 | .700 | |

| | |
|---|---|
| Q 16 | .585 |
| Q 17 | .840 |
| Q 18 | .593 |
| Q 19 | .643 |
| Q 20 | .619 |
| Q 21 | .700 |

We can see that the table shows the results found on the table above states that statement 1 to statement 21 are corrected items with the total correlation of 0.33. This shows that every statement is declared invalid. Cronbach's alpha for the questionnaire learning independence >0.650 with a value of 0.931. This shows that it is reliable questionnaire used in the study.

## CONCLUSION

Based on the results of validity and reliability of the 21 instruments study on the influence of FCL to undergraduate nursing students' independent learning in Banten Province, the strap statements indicate that the value is a valid and reliable questionnaire Cronbach alpha for learning independence >0.650 with a value of 0.931.

## RECOMMENDATION

Although each item instrument has been declared valid and reliable, researchers still must pay attention to good classroom management when this questionnaire is used for a study class act. Because even though the instrument has been declared valid and reliable, the situations and conditions of the students can still possibly have an effect on the validity of study results.

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