



Validation Procedures in Research and Evaluation: Implications for Quality Education in Nigeria

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Abstract

This study investigated the influence of validation procedures in research and evaluation in the south-South zone of Nigeria using survey research design. The population for the study is made up of all the lecturers in the South-South tertiary institutions. The proportionate stratified simple random sampling technique was used to draw two thousand (2000) lecturers as the sample size of the study. The instrument for data collection was the modified four point Likert Scale, titled “influence of validation procedures in research and evaluation (IVPRE)” designed by the researcher. The instrument was validated by experts in educational research, measurement and evaluation. 0.86 was the reliability coefficient obtained as a measure of internal consistency by the RULON statistical technique. Five research questions were answered using Pearson Product Moment Correlation (PPMC) while five hypotheses were tested by transforming the scores to t-test statistics at 5% probability level. The results revealed significant influence or validation procedures in research and evaluation based on the planning stage of the objectives of instruction, specifying the research and evaluation content areas to be covered, the use of table of specifications on the content areas covered, group of resources persons (experts) and item analysis on the content areas covered respectively. Therefore, the researcher recommends proper and adequate planning stage of objectives of instruction, the involvement of research and evaluation experts and the use of item analysis among others for the improvement of validation procedures in research and evaluation.

Keywords: Validation, Procedures, Research, Evaluation, Quality Education, Nigeria.

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INTRODUCTION

A measuring instrument is a device for measuring physical quantities, specifically in the physical sciences. It is an activity use to obtain and compare the physical quantities. Good measuring instruments should have some essential psychometric properties. These include, validity, reliability and usability, but this study focused on the latter i.e. validity.

Hence, validity refers to the extent or degree of which a test measures what it is intended to measure. Onunkwo (2002) defined validity as “an expression of the degree to which a test measures the qualities, abilities and information which is designed and supposed to measure”. The author further stated the various types of validity as follows: content validity, construct validity, criterion-Related validity, predictive validity, Concurrent validity and face validity. Interestingly, content validity is the degree to which the items of an instrument measure a representative sample of the subject matter, content and instructional objectives. It is worthy of note that both the subject-matter, content and instructional objectives are crucial items in the determination of content validity. Construct is an abstract psychological trait such as intelligence, anxiety, aggression, emotion etc. Therefore, construct validity is the accuracy with which an instrument describes an individual in terms of some psychological traits. A criterion is a behaviour which is already known or agreed to be a valid measure of a trait. Thus, criterion validity is based on the correlation between scores on the test and scores on the criterion (i.e. the predictor scores and criterion scores). On the predictive validity, it is the power of the measuring instrument to predict some future events such as academic achievement, specific aptitudes etc. It is the most relevant in the intelligence tests, aptitude tests, interest and attitude tests respectively. Again, concurrent validity is a measure of behaviour in its current form; hence, it is used to diagnose the existing status of the behaviour. It shows the relationship between test scores and indices of criterion status obtained approximately at the same time.

Finally, face validity refers to what tests or other measuring instruments appear superficially to measure as opposed to what they actually measure. It seeks to examine whether the contents of an instrument appeals to the students as what the instrument should cover.

Therefore, validity and validation are the most fundamental issues in the development and evaluation of measuring instruments. On this note, validity could be seen as the level of excellence on the inferences, claims or decisions drawn from the scores of an instrument. While, validation is a proof of the evidence to support the good equality, measure of being meaningful and the quality of being useful of the decision and inferences that can be made from the instrument scores (Zumbo, 2009).

So, the purpose of validation is to ensure the integrity of all techniques and procedures used for the development of research and evaluation instruments. In this wise, validation is the process of attesting, authenticating, confirming, and proofing among others used by the scientific community to acquire the necessary information in order to assess the ability of the technique or procedure to reliably obtain a desirable results. Validation simply means determining the conditions under which results can be obtained and the limitations of the technique or procedure equally ascertained. So, validation process identifies the critical aspect of the technique or procedure that must be carefully followed and monitored to achieve effective validation procedures in research and evaluation.

Research can be defined as a systematic and objective search for new knowledge and the application of the knowledge to provide solutions to novel problems (Nworgu, 2006). Educational research therefore, is a systematic approach to provide solution to educational

problems (Conney, 2015). Consequently, when the researchers identify the problems and proffer solutions to the problems, the need to evaluate the outcomes of the proffered solutions for the effective attainment of goals becomes irrevocable. This implies that the information provided by the researchers enable the evaluators to delineate, obtain and provide useful information for judging decision alternatives. This is because evaluation involves making value judgement on a person, thing, programme, and object, etc., based on data elicited (Onunkwo, 2002). To this end, evaluation means a systematic process of collecting, analysing and interpreting information (data) to determine the degree to which instructional objectives are achieved. So, it gives a total comparative value judgment based on the data collected.

Again, the entire process of research and evaluation involves the act of investigating, constructing and administering instruments to individuals, collecting relevant data, analyzing such data and making decisions based on the information. Still, there seem to appear some recurring problems in research and evaluation.

Evaluation being the highest level of the cognitive taxonomy, involves value judgment made on object, things, programmes, students' academic performance among others. Evaluation provides continuous feedback concerning successes and failures of students' performances or programmes. This feedback is necessary because it energizes hard work and identify errors that need rectification so as to achieve the desire objectives of the instruction.

Similarly, Hybley and Zumbo (2013) in their study submitted that the absence of evaluation experts in the validation procedures of many instruments have rendered most of the instruments invalid. In addition, Markus and Borsboom (2013) anchored that the efficacy of validation procedures are based on the inputs of evaluation experts and the analysis of the items in constructing the instrument. This implies that the involvement of evaluation experts and the use of item analysis are major factors that could influence the validation procedures in research and evaluation.

Statement of the problem

Over the years, tremendous strides have been made in terms of achieving more objectives and accurate appraisals of research and evaluation (Osegbo & Ifeakor, 2008). In the same vein, there have been increased precisions in the measurement of the different attributes of research and evaluation. But, that notwithstanding, there exist some problems in the validation procedures in research and evaluation. Some of the problems include: different views on the construction of research instruments, analysis of items, reliability of the items and validation procedures of the instruments to mention but these.

Therefore, at this juncture, there is need to investigate the validation procedures in research and evaluation. According to Yoloye (2008), good validated and evaluated research instruments produce tested and satisfactory results that could stand the test of time. Hence, this is the area where the study intends to underscore.

Purpose of the study

In general term, the purpose of this study is to ascertain whether the validation procedures could influence research and evaluation. Specifically, the study sought to:

- Determine the influence of planning stage of the objectives of instruction on the validation procedures in research and evaluation.
- Find out the extent of specifying the content areas to be covered and how it influences validation procedures in research and evaluation.
- Examine the influence of table of specifications on the validation procedures in research and evaluation.
- Investigate the influence of resource persons (experts in the field) on the validation procedures in research and evaluation.
- Determine the influence of item analysis of the instrument on the validation procedures in research and evaluation.

Research Questions

The following research questions guided the study:

- To what extent does planning stage of the objectives of instruction influence the validation procedures in research and evaluation?
- To what extent does specifying the content areas to be covered influence the validation procedures in research and evaluation?
- What is the influence of table of specifications on the validation procedures in research and evaluation?
- To what extent does the involvement of resource persons (experts in the field) influence the validation procedures in research and evaluation?
- What is the influence of item analysis of the instrument on the validation procedures in research and evaluation?

Hypotheses

The following null hypotheses are formulated to guide the study at 5% probability level.

- There is no significant relationship between planning stage of the objectives of instruction and validation procedures in research and evaluation.
- There is no significant relationship between specifying the content areas to be covered and the validation procedures in research and evaluation.
- The relationship between using table of specifications and the validation procedures in research and evaluation is not significant.
- The relationship between using a group of resource persons (experts in the field) and the validation procedures in research and evaluation is not significant.
- There is no significant relationship between using item analysis on the instrument and the validation procedures in research and evaluation.

Significance of the Study

The significance of this study is as follows:

- It would revalidate the validation procedures in research and evaluation.
- It would ensure proper and adequate planning stage of the objectives of instruction in order to achieve the objectives.
- It would show the important and effective use of experts in test construction.
- It would invigorate the complete use of item analysis for better item selection.
- It would provide the basic guideline for the validation procedures in research and evaluation.

Scope of the Study

The study is carried out in Rivers State. Specifically, the study focused on the influence of planning stage of the objectives of instruction, specifying the content areas to be covered, the use of table of specifications, item analysis and the use of experts in the validation procedures in research and evaluation.

METHODS

The study adopted a correlation research design. This is because the design seeks to establish the extent of relationship, association or co-variance between two or more variables. A correlation coefficient could reveal both the magnitude and direction of the relationship between the variables.

The population of the study includes all the academic staff in the tertiary institutions in the south-south. The proportionate stratified random sampling technique was used to draw two thousand (2000) lecturers as the sample size from the population. The instrument for data collection was self-designed questionnaire titled “Influence of Validation Procedures in Research and Evaluation (IVPRE)” using the modified four point Likert Scale. Face and content validity were used in this study. Professionals in research, measurement and evaluation vetted the items on the questionnaire and considered them fit for the study. On the internal consistency of the instrument, the Rulon formula was used in the two administrations which give a reliability coefficient of 0.86.

Data used in this study were collected from the administration of the questionnaire to the lecturers in the tertiary institutions under investigation. The responses of these lecturers from the instruments generated data for the study. Pearson Product Moment Correlation (PPMC) was used to answer the research questions and the hypotheses were tested by transforming the scores into t-test statistics at 5% probability level.

RESULTS

The findings of the study are presented table by table according to the research questions answered and hypotheses tested.

Research Question One

To what extent does the planning stage of the objectives of instruction influence the validation procedures in research and evaluation?

Table 1: Showing the Pearson Product Moment Correlation (PPMC) between the planning stage of the objectives of instruction and validation procedures in research and evaluation

Variable	N	R	R ²	$\sqrt{1 - r^2}$	Percentage
Planning stage of objectives of instruction And Validation procedures in research and evaluation	2000	0.864	0.746	0.504	75

In table 1, the correlation coefficient is 0.864, coefficient of determination is 0.746, while the coefficient of alienation is 0.504 with a 75% variation. Therefore, the planning stage of the objectives of the instruction accounted for 75% influence on the validation procedures in research and evaluation, while the remaining 25% could not be accounted for.

Research Question Two

To what extent does specifying the content areas to be covered influence the validation procedures in research and evaluation?

Table 2: Showing the Pearson Product Moment Correlation (PPMC) on the relationship between specifying the content areas to be covered and the validation procedures in research and evaluation

Variable	N	R	R ²	$\sqrt{1 - r^2}$	Percentage
Specifying the content areas to be covered And Validation procedures in research and evaluation.	2000	0.798	0.637	0.602	64

Table 2, results showed that the correlation coefficient 0.798, coefficient of determination 0.637, coefficient of alienation 0.602 and 64% variation. Hence, the 64% is the influence of validation procedures in research and evaluation based on specifying the content areas to be covered while the remaining 36% could not be accounted for.

Research Question Three

What is the influence of table of specifications on the validation procedures in research and evaluation?

Table 3: Showing the Pearson Product Moment Correlation (PPMC) on the relationship between table of specifications and validation procedures in research and evaluation

Variable	N	R	R ²	$\sqrt{1 - r^2}$	Percentage
Table of specifications And validation procedures in research and evaluation	2000	0.865	0.748	0.502	75

From table 3, it was observed that the correlation coefficient 0.865, coefficient of determination 0.748 and coefficient of alienation 0.502 respectively. Therefore, using table of specifications accounted for 75% influence on the validation procedures in research and evaluation. The remaining 25% could not be accounted for. It is an indication that the use of table of specifications influenced the validation procedures in research and evaluation.

Research Question Four

To what extent does using group of resource persons (experts in the field) influence the validation procedures in research and evaluation?

Table 4: Showing the Pearson Product Moment Correlation (PPMC) on the relationship between the involvement of resource persons (experts in the field) and validation procedures in research and evaluation

Variable	N	R	R ²	$\sqrt{1 - r^2}$	Percentage
Resource persons (experts) And Validation procedures in research and evaluation	2000	0.864	0.746	0.504	75

In table 4, the following were observed: correlation coefficient 0.864, coefficient of determination 0.746 and coefficient of alienation 0.504. Consequently, using a group of experts accounted for 75% influence on the validation procedures in research and evaluation while the remaining 25% could not be explained.

Research Question Five

What is the influence of item analysis on the validation procedures in research and evaluation?

Table 5: Showing the Pearson Product Moment Correlation (PPMC) on the relationship between item analysis and validation procedures in Research and evaluation

Variable	N	R	R ²	$\sqrt{1 - R^2}$	Percentage
Item analysis And validation procedures in research and evaluation	2000	0.874	0.764	0.486	76

A critical observation in table 5 showed that correlation coefficient 0.874, coefficient of determination 0.764, coefficient of alienation 0.486 and 76% variation. Hence, item analysis accounted for 76% influence on the validation procedures in research and evaluation while the remaining 24% could not be explained.

Hypothesis One

There is no significant relationship between the planning state of the objectives of instruction and validation procedures in research and evaluation.

Table 6: Showing t-test statistical analysis on the relationship between the planning stage of the objectives of instruction and the validation procedures in research and evaluation

Variable	N	R	df	t-cal	<i>t – crit</i>	Decision
Planning stage of the objectives of instruction Vs Validation procedures in research and evaluation	2000	0.864	1998	0.28	1.96	Rejected

In table 6, the results obtained show that the correlation coefficient 0.864, t-calculated value 8.28 and t-critical table value at df 1998 was 1.96. Since the t-calculated value of 8.28 was greater than the table critical value of 1.96, the null hypothesis of no significant relationship between the planning stage of the objectives of instruction and validation procedures in research and evaluation was rejected and the alternate hypothesis of significant relationship was accepted.

Hypothesis Two

There is no significant relationship between specifying the content areas to be covered and the validation procedures in research and evaluation.

Table 7: Showing t-test statistical analysis on the relationship between specifying the content areas to be covered and the validation procedures in research and evaluation

Variable	N	R	df	t-cal	<i>t – crit</i>	Decision
Specifying the content areas to be covered. Vs Validation procedures in research and evaluation	2000	0.798	1998	7.56	1.96	Rejected

Results in Table 7 showed that the correlation coefficient 0.798, t-calculated value 7.56 while t-critical value at df. 1998 was 1.96 respectively. Hence, the null hypothesis of no significant relationship between specifying the content areas to be covered and the validation procedures in research and evaluation was rejected while the alternate hypothesis of significant relationship was accepted. This is because the t-calculated value of 7.56 was greater than the table critical value of 1.96.

Hypothesis Three

The relationship between table of specifications and the validation procedures in research and evaluation is not significant.

Table 8: Showing the t-test statistical analysis on the relationship between using table of specifications and the validation procedures in research and evaluation

Variable	N	R	df	t-cal	<i>t – crit</i>	Decision
Table of specifications Vs Validation procedures in research and evaluation	2000	0.865	1998	8.32	1.96	Rejected

On table 8, the results showed that the correlation coefficient 0.865 and t-calculated value 8.32. Thus, the null hypothesis of no significant relationship between the use of table of specifications and the validation procedures in research and evaluation was rejected and the alternate hypothesis of significant relationship was accepted. This is because the t-calculated value 8.32 was greater than t-critical value of 1.96 at a df. of 1998.

Hypothesis Four

The relationship between resource persons (experts in the field) and the validation procedures in research and evaluation is not significant.

Table 9: Showing the t-test statistical analysis on the relationship between using resource persons and the validation procedures in research and evaluation

Variable	N	R	df	t-cal	t – crit	Decision
The use of resource persons (experts) Vs Validation procedures in research and evaluation	2000	0.864	1998	6.70	1.96	Rejected

The critical observation in table 9 revealed that correlation coefficient 0.864, t-calculated value 8.32 was greater than the table critical value of 1.96 and at df 1998. Hence, the null hypothesis of no significant relationship between using the resource persons (experts) and the validation procedures in research and evaluation was rejected and the alternate hypothesis of significant relationship was accepted.

Hypothesis Five

There is no significant relationship between item analysis and the validation procedures in research and evaluation.

Table 10: Showing the t-test statistical analysis on the relationship between item analysis and the validation procedures in research and evaluation

Variable	N	R	df	t-cal	t – crit	Decision
Using item analysis Vs Validation procedures in research and evaluation	2000	0.874	1998	9.50	1.96	Rejected

In table 10, it was observed that 0.874 was the correlation coefficient, 1998 was the degree of freedom (df) and t-calculated value of 9.50 was greater than the table critical value of 1.96. Thus, the null hypothesis of no significant relationship between using item analysis on the validation procedures in research and evaluation was rejected and the alternate hypothesis of significant relationship was accepted.

DISCUSSION

The results of the study are discussed on the bases of research questions answered and hypothesis tested. The research question one (table 1), the results obtained show high correlation coefficient of 0.864, coefficient of determination 0.746, coefficient of alienation 0.504 and 75% variation between planning stage of the objectives of instruction and validation procedures in research and evaluation. Thus, the planning stage of the objectives of instruction accounted for 75% influence on the validation procedures in research and devaluation. The results of hypothesis one in table 6 revealed that the correlation coefficient 0.864, and t-calculated value 8.28 was greater than the table critical value 1.96; at df. of 1998 and the null hypothesis was rejected. Consequently, the results had shown that planning stage of the objectives of instruction on research and evaluation significantly influenced the validation procedures. The reason is that planning stage of the objectives of instruction enables the researchers and evaluators to focus on the variables of study. This will enable the objective of instruction to be achieved.

Thus, the findings of this study is in agreement with the study of Onunkwo (2002) who submitted that the planning stage of the objectives of instruction influence the validation procedures of instruments. In line with the above, Kane (2006) in his study anchored that the purpose of planning stage of the objectives of instruction was to ensure the integrity of all the techniques and procedures in validating the instruments which the results of the present study supported. Therefore, evidence abound that planning stage of the objectives of instruction are anti-dot in the validation procedures in research and evaluation.

The research question two in table 2, the followings were observed: correlation coefficient 0.798, coefficient of determination 0.637, coefficient of alienation 0.602 and percentage variation 64%. Hence, specifying the contents areas to be covered accounted for 64% influence on the validation procedures in research and evaluation. In hypothesis two (i.e. table 7), the results obtained showed that the correlation coefficient of 0.798, and t-calculated value of 7.56 was greater than the table critical value of 1.96 at df. 1998 respectively. For this reason, the null hypothesis was rejected. Interestingly, it is an indication that specifying the content areas to be covered significantly influences the validation procedures in research and evaluation. Therefore, the results of this study is inconsonance with that of Kane (2013) who in his study submitted that identifying the content areas to be covered influence the validation procedure in developing an instrument. This is because research and evaluation questions are not open ended discussions. So, they have predetermined limit or boundary and planned ending in order that they do not develop into several.... Consequently, at each point in time what to investigate and assess are always specified so that the purpose could be achieved.

In research question three (table 3), the results obtained show high correlation coefficient 0.865, coefficient of determination 0.748 and coefficient of alienation 0.502 while the percentage influence on table of specifications on the validation procedures in research and evaluation accounted for 74% and the remaining 26% could not be accounted for. It shows that relationship exist between table of specifications and validation procedures in research and evaluation. The results of hypothesis three in table 7 showed that the correlation coefficient 0.865, and table of critical value of 1.96 at df. 1998 was less than the t-calculated value of 8.32 and the null hypothesis was rejected. Indicating that using table of specifications significantly influenced the validation procedures in research and evaluation. The reason is that the use of table of specifications ensure that the amount of errors present in the validation procedures are reduced to the bearest minimum so as not to affect the validation process of the instrument to large extent.

Based on the foregoing, the results of this study are in conformity with the findings of Ohuche and Akeju (1988) and Onunkwo (2002). In Ohuche and Akeju submissions, they maintained that constructing test blue prints will ensure adequate coverage of all the interest areas in developing and validating instruments. Similarly, Onunkwo in his finding also submitted that the use of test blue prints in validation procedures is a confirmation of the distribution of content areas with respect to the various cognitive levels. It is objective evidence specifying the requirement to be met. Conclusively, there is a positive relationship between table of specifications and validation procedures in research and evaluation. Thus, using table of specifications are necessary steps in the validation procedures in research and evaluation.

The results of research question four in table 4 showed that 0.864 was the correlation coefficient, 0.746 was the coefficient of determination, 0.504 was the coefficient of alienation and 75% variation. Therefore, using group of resource persons in the validation procedures in research and evaluation accounted for 75% while the remaining 25% could not be explained.

This implies that there is a high positive relationship between the use of resource persons and the validation procedures in research and evaluation. Similarly, the results of hypothesis four showed that the correlation coefficient 0.864, and t-calculated value of 6.70 was greater than the t-critical value of 1.96 at df. 1998. So, the null hypothesis was rejected. The implication of the foregoing is that the use of resource persons (experts) significantly influence the validation procedures in research and evaluation. Therefore, the validation procedures in research and evaluation involve using group of experts to obtain the desired results.

The results of this study support the findings of Hubley and Zumbo (2013) who in their study maintained that the use of experts in the validation procedures of instruments is very consequential. This implies that involving experts in research and evaluation are determinant steps in the validation procedures in research and evaluation. Hence, enhancing the efficacy of validation procedures of the various instruments.

The aim is to ensure clarity of words and plausibility of distracters to enable the validation procedures meet the acceptable standards. Research question five in table 5, the results obtained showed that the correlation coefficient 0.874, coefficient of determination 0.764, coefficient of alienation 0.486 and 76% variation of the influence of item analysis on the validation procedures in research and evaluation. Thus, the item analysis accounted for 76% influence on validation procedures in research and evaluation while the remaining 24% could not be account for due to extraneous errors. This shows high positive relationship between item analysis and validation procedures in research and evaluation.

In the same manner, hypothesis five in table 10, the results showed that the correlation coefficient was 0.874, and the t-calculated value of 6.70 was greater than the table critical value of 1.96 at df. of 1998, showing that the null hypothesis was rejected. This shows the significant influence of item analysis on the validation procedures in research and evaluation. Consequently, it could be depicted from the results that item analysis significantly influences the validation procedures in research and evaluation. The reason is that finding out the effectiveness of each item and what each item contributes to the validation procedures will ensure that its meets the acceptable standard.

Therefore, the present study supported the finding of Markus and Borsboom (2013) who investigated the influence of item analysis on test validity theory. The results obtained revealed that item analysis significantly influenced the effectiveness of the test items. It shows that item analysis influenced the test results. This is because item analysis seeks to establish the difficulty and discrimination abilities of the test items, as well as the effectiveness of each alternative.

Thus, assess the essential qualities of the test items and enhance the goodness, validity and reliability of the entire test, and this result is in line with the results of the present study.

Implications for Quality Education

Quality education is one that provides the learners with the potential to become economically productive, develop livelihoods, strengthen peaceful and democratic societies and to enhance individual standard of living. Quality education is a dynamic concept changing with the needs of the society and equips learners for further life among others.

Onwe, Opa and Ugadu (2013) noted that poor quality of measuring instruments results to students poor academic performances in schools and aid examination malpractices. Thus, lower the standard of education in Nigeria when compared with the developed countries. Interestingly, no nation can rise beyond her educational system. This means that the level and quality of education in any society determines the level and quality of development in that society.

For that to achieve quality education include: the teacher, educational content, leaning environment, school environment and funding to mention but these. Consequently, the implication of this study centered on the improvement of educational content validity. This is because when the measuring instrument are content valid and reliable, the responses from the instruments can be used to predict students' academic performance in schools. In this wise, the validation procedures in research and evaluation of the measuring instruments are sine qua for quality education.

CONCLUSION

Based on the findings of this study, the following conclusions are drawn:

There is a positive significant relationship between the planning stage of the objectives of instruction and the validation procedures in research and evaluation, there is high positive significant relationship between specifying the content areas to be covered and the validation procedures in research and evaluation, there is a significant relationship between using table of specifications and the validation procedures in research and evaluation, there is a strong significant relationship between using a group of resource persons (experts) and the validation procedures in research and evaluation, and finally, there is a positive significant relationship between using item analysis and the validation procedures in research and evaluation.

Recommendations

The following recommendations are made based on the findings:

- Proper and adequate planning of the objectives of instruction to improve the validation procedures in research and evaluation.
- Experts in research and evaluation should be adequately involved in the validation procedures in research and evaluation to improve on the effectiveness and appropriateness of the items to be validated.
- Compulsory use of item analysis to establish and improve on the effectiveness of each alternative in the validation procedures in research and evaluation.

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