DEVELOPING A SCALE TO MEASURE THE COGNITIVE AND AFFECTIVE ATTITUDES OF THE UNIVERSITY STUDENTS TOWARDS RESEARCH

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Abstract:
Determination of university student's attitude towards pursuance of research as doctorate degree was evaluated in this study with cognitive and affective domain in positive and negative forms. The aim of the study was to construct a measurement scale with a higher level of accuracy to quantify the qualitative responses of the higher education students for research. The measurement scale was a questionnaire, developed in this research work for survey and was standardized by subject experts. The collected data was interpreted with basic statistics and the result showed 82.16% reliability of the survey tool by Cronbach's Alpha test.
Keywords: Research, attitude, scale, survey, reliability

Introduction:

Education system resembles the most critical and complex level of teacher- educator knowledge sharing process in the higher education or university education system. The university education is mainly a formal education system in which the degrees are offered from graduation up to Post-Doctoral research levels. The university education is a direct and dynamic teaching-learning process with a variety of subjects and streams under higher study. This is the dynamic process of knowledge transfer from the mentors to the learners in the formal and institutional education environment. In the higher education system, the mentors are the supervisors, who help the students or learners to learn the theories of knowledge with lab-to-land activities. The curriculum construction for the university degrees and courses deals with constructive syllabus orientation of different subjects, lesson numbers and age specific syllabus combined with extracurricular activities.

Human life and standard of their living is influenced by discovery of science with the help of research. Inventions or discovery are the end term outcome of the research process and techniques. Not only in the fields of science and medical science, but also the technological development and education system became advanced with the blessing of research (Gross, 2001). The research activity aims to find out facts or theories to share the concept and knowledge of the theme of discovery for others welfare. It performs a vital role in preparing graduate students by sharing its steps, hidden concepts and experiences favorable for learning (Fishbein & Ajzen, 1975). Research is a methodical system of invention, where the discovered information is oriented in a way of standardization. The rate of progress of society and other development activities of a nation become measurable by research in modern days. Research is the process of collecting and analyzing information to increase our understanding of the phenomenon under study (Swindoll, 2012).

Attitude is a stimulus dependent response and consists of three inter dependent components viz., cognitive, behavioral and affective components. As per the question of appearance, attitude possesses

bipolar character and acts as physical or behavioral response to a specific stimulus. Like every psychological exposures, attitude is invisible in nature. So, the attitudes with overt responses cannot be measured properly. Attitudes of a person can be measured on the basis of outcomes derived from individual responses in respect to his action, verbal statements, opinions, feelings and disposition about the object. In individual life span with any social environment; attitudes, psychological responses, physiological gestures etc. are the measurable indicators of human behavior over stimulus and experiences. With its multidimensional appearance, attitude is a composite frame of three components viz., cognitive component, affective component and conative component (Albarracin et al., 2005).

The cognitive component is the combination of knowledge, opinion, idea and vision to the attitude object. Attitudes may vary from expected to unexpected and favorable to unfavorable opinions of knowledge directed by cognitive attitude. Attitude may differ qualitative or quantitatively on the basis of cognitive component structure.
The affective component is the emotional experiences in a range from pleasant to unpleasant, preferred to non-preferred effects of attitude object. The affective components may have control over motivation and directivity.
Attitude is not an innate tendency but it is learnt. The relationship between attitude, self-efficacy and academic achievement has always been a topic of interest in social sciences, particularly in the fields of educational and social psychological researches. Attitude develops and is organized through experience. It is assumed that the appearance of an attitude is dependent on learning or social interactions. Attitude refers rearing of thought and predisposition to respond to an object. Researcher like Idu (1988), indicated many but similar patterns of attitude formation are the main sources of attitude include assimilation from the environment, emotional effects of certain kinds of experiences and direct intellectual processes.

The concept of attitude is often divided into three aspects: cognitive, affective and behavioral aspects of attitude. The cognitive aspect consists of thoughts and views about an object or an event, the affective aspect consists of feelings and moods towards an object, and the behavioral aspect is the actual behavior of a person or their intention to exhibit or avoid certain behaviors. The development of a positive attitude towards research depends on the environment of the education system. The cognitive aspect towards research refers to the fact that students need to know and comprehend the prospects and possibilities of pursuing research and its outcomes in future. The affective aspect concerns the fact that students need to feel good about and create positivity toward conducting research as education activity. Finally, the behavioral aspect occurs when a student tries to attain research, or plans to learn more about it. In case of behavioral attitude, a range of motivation and re-enforcement is essential for the students for development of their willingness to shift their behaviour in performing research. A positive or negative attitude may relate directly or indirectly towards a specific subject of research. Basically, the attitude towards research is a detailed study of understanding, thinking, feeling and reacting or behaving towards research. Identification of the attitudes towards research is essential, so that the students will develop positive attitude towards research to facilitate their future learning. Attitude study is a psychology related exposure of human response in changing environments or situations by temporal fluctuation. As a psychological behaviour of human being, attitude is modifiable with variations in perception, motivation, cognition and emotion (Papanastasiou, 2005).

A bunch of studies have been performed to explore the attitude towards research with the result that attitudes towards research may not positive in general. As per students thought, research is very hard

and lengthy process of study (Adams & Holcomb, 1986). The concepts of research and its essence seem to be a burden for the students that may affect their professional life. Graduation and other degree course students assume research in a negative manner as they had to go through different obstacles and could not reach the concepts and facts of the research. In other hand, postgraduate students are more positive minded and motivated and may take research course more seriously for the development of their professional life (Papanastasiou, 2005).

The present research will find out the direction of students attitudes towards quantitative as well as qualitative research methods, with their outcomes by the students' performance. A least attention and influence to research by the administrators and the educated persons of the society may move the trend of research and developmental activities backward in the national community. A nation may be progressive in research and developmental activities with the favor and powerful initiatives of the administrators, educationists and scientists. A research work requires a vast knowledge, intelligence for solving problem, courage for analysis and patience for interpretation.

Previous studies revealed that students had inadequate knowledge of the scientific examination process, but they were very interested in pursuing future research. Positive attitude is the main way to bring success in completion and interpretation of the research. Attitude is the setup of readiness of mind to perform or act against a specific stimulus.

The present research aims to origin a quantitative measurement scale based on qualitative responses. The questionnaire is the experimental tool that furnishes the responses of students' cognitive and affective attitudes as their attentions towards the research as an academic process. In this experimental study, the researcher has developed an easy, new, simple to comprehend, reliable in use and potentially performing questionnaire for future survey after the chronological works of previous researches and educationists.

Methodologies:

The area of the study was S R B. Training College; district Darjeeling under Baba Saheb Ambedkar Education University, West Bengal. For this study, a questionnaire was prepared for survey by screening of primary data. Here the newly prepared questionnaire was considered as the experimental tool for the educational survey. A number of questions (42) were prepared by the researcher. After screening of various questions by expert educationists, 20 questions were taken for final survey. The selected questions were divisible into four sections i.e., each of the subdivisions like positive cognitive attitude towards research, negative cognitive attitude towards research, positive affective attitude towards research and Negative affective attitude towards research with five numbers of questions. Quantification of qualitative responses was carried out by The Likert's (1932) five point rating scale a variety ranging from strongly agree, agree, partially agree, disagree and strongly disagree for positive responses with marks range 5 to 1 in descending manner. In case of negative responses, the scale was gradually inverted. Total 82 students of B.Ed. second semester was invited for this study. Among them, 32 responses were incomplete the rest

50 students responded completely and were considered for the study. Data gathered in the survey were analyzed by statistical interpretation and the reliability study was done by Cronbach's alpha correlation coefficient. Attitude levels of the students toward research were analyzed by weighted mean among descriptive statistics.

Descriptive interpretation of responses is: 4.21-5.00 - Strongly agree, 3.41-4.20 – Agree, 2.61-3.40 -

Partially agree, 1.81-2.60 – Disagree, 1.00-1.80 - Strongly disagree. The reliability study of questionnaire was carried out by the Cronbach's alpha correlation coefficient. According to the reliability parameter, the internal consistency range of α is excellent – 0.9, good – 0.8 to 0.9, acceptable – 0.7 to 0.8, questionable –0.6 to 0.7 and poor – lower than 0.6.
The aim of the study was to find out the status of reliability, easiness of handling of the newly prepared questionnaire with a standard sampling size of 50 university level students. The study focuses the applicability and potentiality of the questionnaire to correlate between cognitive and affective attitudes of higher education students towards research. The students responded the question options during study by the cognitive attitude of students toward research with positive and negative cognition and the affective attitude of students toward research with positive and negative affective levels.

Result and discussion:
The finally applicable set of the questionnaire includes 20 highly accepted questions with four subdivisions. There are five types of student response options from 1 to 5, in which "1 is the maximum disagreement" and "5 is the maximum agreement'' value of responses. Likerts' five point attitude scale was considered for development of the questionnaire and was applied with a group of university students having a sample size N= 50 to examine the applicability and reliability of it.

The students acquired the number score in a range of 49 to 94 with an average score of 72.5 (table 1). Questions generated with positive sense showed majority of student responses with highest numbers among all the attitude scales toward research. In all the attitude dimensions, the average value showed higher responses in case of positive attitudes (table 1, figure 1.).

Descriptive statistics	Summary of students' response attitudes towards research				
	Positive cognitive attitude	Negative cognitive attitude	Positive affective attitude	Negative affective attitude	Total responses
Max	25	22	24	23	94
Min	12	11	16	10	49
Average	18.5	16.5	20	17.5	72.5

As the student representatives of the survey were trainee teachers, they acquire more than 72% score in average. The lower limit of the score of these higher education students were 49% (table 1). Among total respondents, the highest scorer obtained 94 out of 100 (table 1). From the students' scores it is clear that the university students with professional course showed good results as they have vast knowledge about education and research and in that case the selection of trainee teachers was appropriate for the study. T he students of bachelor and master degree in Education go through the curriculum where the basic ideas about memory, knowledge, cognition, perception, teaching, learning, motivation, emotion, attitude and behavior. So, the trainee teachers are potentially able to comprehend the themes and inner meaning of the questionnaire. As attitude is a qualitative parameter, it is not so easy to respond without critical thinking. The selected trainee teachers responded the statements about attitudes and research activity stated in the questionnaire successfully.

The positive or negative categories of attitude should have significant correlation with research. Research is a process of finding facts about a specific area of a study. The higher education students

may have a normal interest about research as it is the further step of education after master degree. Research is a lengthy academic process that depends on many external factors like locale, supervisor, research topic, tools and techniques, quantified result, correlation with previous research, better publication etc. All these matters led the students to misinterpret the essence of discovery of unexplored data in the research process. With the help of evolution, the traditional human being modified himself by continuous research process and transformed into most educated, social, scientific and global creature of the nature. So, research mentality is more or less innate quality of human being. Lacuna in awareness, lack of proper basic education, linguistic problem, system corruption, need of earning, time taking procedures laid research away from the higher education students.

In the nature, the human beings respond against a specific stimulus exposure through different sense organs. Attitude may be such response created by cognition, perception, mental activity or behaviour and respond positively to research as academic system in favourable condition.

As the experimental tool used in this study was newly generated, its applicability and matter of reliance is utmost important in research. In this context, it is essential to test the data set by a standard reliability test. There was a range of variance from 0.629 to 2.486 in the reliability study among the 50 students. From the result it can be stated that the calculated value of the Cronbach's alpha coefficient was 0.821 (Table 2) and it falls within the range of table value from 0.8 to 0.9 as 'good' in reliability test.

Table 1: Students' responses of attitudes toward research

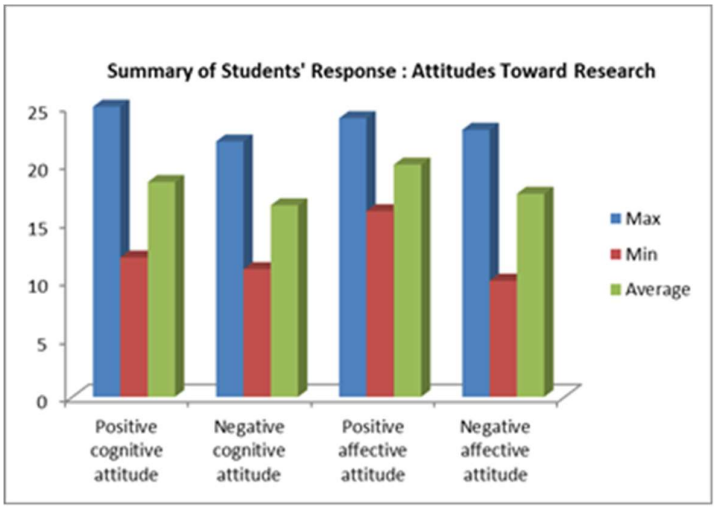

Figure 1: Summary of students' response

Table 2: Reliability study Result

Number of Samples	Number of questions	Variance of samples	Cronbach's alpha coefficient (α)	Reliability
50	20	0.629 – 2.486	0.821	Good (0.8 to 0.9)

After a complete procedural sample study, the collected data was interpreted and analyzed by statistical methods on the basis of attempts of the students over newly formed questionnaire. The study was an attempt for establishment of a correlation of higher education students' attitudes to research and developmental activities. Item pool development as resource of questions, almost 42 questions was

prepared as statement for response by the authors (Rees et al., 2002). Among these questions, 20 questioned were selected finally and were applied as statements of the questionnaire. Five items for each division of both cognitive and affective attitudes with positive to negative range was set towards research. The rest items were prepared by literature study (Conway, 2002).

The initial pool of items was 42. All the selected items were assessed on a 1 = strongly disagree, to 5 = strongly agree response scale. In 5 point Likert-type scales, a mid-point of value have been shown (Garland, 1991). Attitude scales In Likarts' five point frame is a measuring device that readily quantify the quality of psychological and emotional parameters like thoughts, believes, perception, affection, anxiety etc. In the study, the attitude questionnaire is a measurement scale which is the way for the respondents to express their perception with a thought of agreement or disagreement.

In descriptive statistics part of obtained response, the students score showed a clear statement of partial agreement towards research in case of both positive and negative cognitive attitudes. A range of statements from partial agreement to agreement were found in case of affective domain for both positive and negative attitude towards research (table 3& 4).

From the calculated result it can be said that the students became mentally prepared slowly for attitude sharing towards research and responded for partial agreement (PA) in majority (table 3). As the responses in negative cognitive attitude towards research is set in inverted scale, the responses was in average or partially agree to agree with a composite mean of 3.29 (PA) (table 3).

Table 3: Student's cognitive attitude toward research

Cognitive attitude toward research		Mean	DR
A. Positive cognitive attitude			
1.	Research is precious about its value to every human being	**3.4**	**PA**
2.	Research will expand the sphere of knowledge	**2.92**	**PA**
3.	Research will help students for carrier development	**3.32**	**PA**
4.	Research develops expertise and makes a student skillful in	**3.66**	**A**
5.	All university students should get opportunity to pursuit	**2.92**	**PA**
	Composite mean	**3.24**	**PA**
B. Negative cognitive attitude (Inverted legend)			
6.	Research is a long term process	**2.78**	**PA**
7.	Research is a dependable process of investigation	**3.7**	**A**
8.	Research does not at per all the sectors of carrier	**3.58**	**A**
9.	Research work seems to be difficult to the students for	**3.6**	**A**
10.	Research activity does not correlate the teaching process	**2.8**	**PA**
	Composite mean	**3.29**	**PA**

Table 4: Student's affective attitude toward research

Affective attitude toward research		Mean	DR
A. Positive affective attitude			
1.	The Master Degree students are lucky enough to sit for	**3.44**	**A**

2.	Research increases the interest of researchers by fact finding	**3.5**	**A**
3.	Research work fulfils the goals of researcher	**3.18**	**PA**
4.	Research process favours intellectual development	**3.68**	**A**
5.	Research process strengthens emotional balance of student	**2.52**	**DA**
	Composite mean	**3.26**	**PA**
B. Negative affective attitude (Inverted legend)			
6.	Research imposes a load of information causing agitation of	**3.14**	**PA**
7.	Research work involves selection of different methods and	**3.22**	**PA**
8.	Research findings may sometimes be stressful for	**4**	**A**
9.	Research may cause nervousness due to failure in	**3.58**	**A**
10.	Research may lead the researcher impatient due to	**4.1**	**A**
	Composite mean	**3.61**	**A**

Legend: *4.21-5.00 strongly agree (SA), 3.41-4.20 Agree (A), 2.61-3.40 partially agree (PA), 1.81-2.60 disagree (DA), 1.00-1.80 strongly disagree (SD).*

Affective level of attitude study toward research was somehow similar to the cognitive level. Al over a clear trend of responses from partial agreement to agreement was found in affective domain except the correlation between research and emotional balance was the matter of disagreement (table 4). In this domain, blends of various responses were found and the attitude dimension fluctuated in statements from disagreement to agreement.

In the survey, to apply the questionnaire as a reliable tool and to make it potent, the selection of the students was at random and free from biasness (DeVellis, 2012). There were four divisions considered in the questionnaire applied for sampling for evaluation of student's attitude toward research .The research purposes generation of a quantitative scale to measure the students' qualitative responses about research attitude to develop positive thoughts towards learning and research activity according to the Theory of Planned Behaviour (Conway and Huffcutt, 2003).

The study may provide basic assumption that the newly developed survey questionnaire will gain good workability and reliability to measure the university students' attitude toward research and can establish significant relation of the student's research attitudes with other factors. The study r eveals that the questionnaire is valid for work and the answers of students can quantify for attitude measurement.

The aim of the study was to evaluate student attitudes toward research, the students must have perception about research and it's utility in the societal development. The attitude scale was derived to quantify the qualitative responses in Likart's scale to make it reliable and to make it easy for handling in attitude survey (Kara, 2010). Lacuna lies in the study is only that we have selected the professional course students of higher study for our survey; in other cases any student irrespective of course or subject can take part in the survey method of attitude study.

Evaluation of student attitude toward research is essential to investigate the sense of positivity of

students about research. The present study concludes for a repetition of the survey for development of positive attitude of students. The survey process, students and the questionnaire should be enriched with modern strategies, applicability and the students may have response potential about attitude (Waters et al., 1988). Assessment of students' attitude responses toward research after evaluation, requirements and modifications should be identified by the worker for future rectification.

In the study, the sample size was inadequate and only one private college under the university was selected. So, the attitudes toward research of other college students were unknown for the researcher that may constrain to generalise the thoughts of finding. A longitudinal study instead of one time survey is more fruitful to identify the changes in attitude statements of the students toward research over time. It will be more valuable for this study to frame it with case specific pre-test and post-test method with reliability and validity study (Douglas and Purzer 2015).

It is clear that, our findings will explore some new information over the traditional conceptual literature about attitude scale and can correlate its trend of positivity to research for a golden future. The procedural study was engaged in a set of activities like survey tool designing, data interpretation by descriptive statistics and measurement of its reliability that will help the future researchers for attitude study. With this fundamental study, the researches may go through validity study and correlation with such other parameters. This study may become helpful for the students to make decision of pursuing research or for their social establishment in their future professional life.

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