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Construction of Attitude Scale: Attitude of Schoolteachers Towards Teaching Profession

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Abstract

The progress of the nation is based on the competencies of the citizens, and the overall development of the person depends on the effectiveness of the educational system implemented in the country. The teacher is a key factor in the implementation of educational programs. Without a favorable attitude toward the teaching profession, teachers cannot do well in the teaching profession. Regarding this context, this study was conducted to construct an attitude scale to measure the attitude of schoolteachers towards the teaching profession. Steps of standardization of the test were adopted to construct a reliable and valid tool. Piloting was made in the Indo-Nepalese context. A quantitative research design was used in this study. A draft of 50 statements was designed, and 40 were selected on the basis of expert judgment. A sample of 374 schoolteachers from five districts of Nepal and India was selected using a random sampling technique. Eight statements were rejected based on item analysis and respondents' suggestions. A standardized attitude scale was developed comprising 32 statements, which were again categorized into eight factors on the basis of factor analysis. Various reliability coefficients ranging from .80 to .87 were found. For interpretation of the results, z-score and percentile norms were developed. This test will be beneficial to researchers who are interested in identifying the attitudes of schoolteachers in the Indo-Nepalese context.

Keywords: Attitude scale, standardized test, teaching profession, factor analysis, z-score norms

Introduction

Attitudes are likes and dislikes (Bem, 1970, p. 14), which are the states of readiness developed through experience, which influence an individual's response to all objects and situations with which it comes into contact (Allport, 1935, p. 34). Attitudes are positive or negative evaluative statements about objects, people, or events that express how an individual feels about something (Robbins, 1994, p. 17). It is a psychological tendency that involves evaluating an entity with either favor or disfavor (Eagly & Chaiken, 1993, p.1). It is also taken as a learned predisposition to respond consistently favorably or unfavorably to particular objects (Fishbein & Ajzen, 1975, p. 6). However, Wilson (1998, as cited in Schwarz and Bohner, 2001) suggested that individuals may hold multiple attitudes about an object, accessing different ones at different points in time.

Behavior and likes or dislikes of a person towards any person, object, or event depends on the attitude of the person towards them. A person can do well in any profession, occupation, or other field if he or she has a positive attitude towards that field. So, it is necessary to identify the attitude of the people towards their involvement. Rating scales measure attitudes. Rating scales are techniques by which observers or raters categorize objects, events, or people using continuous numerals to represent them on a continuum (Singh, 2012, p. 263).

Quality education is one of the factors required for the progress of the nation. The teacher is a key factor in the educational process and innovations (Altbach, as cited in Gao, 2009, p.9). Teachers can make a difference in the lives of the nation and children (The White House, Office of the Press Secretary, 2011, p.4). Teaching is considered a distinctive profession (Tezcan, 1996) because pupils develop talents in the teaching process (Karsli, 2007). Thus, the teacher has a significant role in the teaching profession and the all-around development of children and the nation. However, teachers cannot do well in the teaching profession if they do not have a positive attitude towards the teaching profession. So, the attitude of the teachers should be identified using the appropriate methods/tools. As attitude is a psychological tendency, it can be measured by using appropriate psychological tests. Generally, rating scales are used to measure such traits. The Likert-type attitude scale is one of the rating scales that is broadly used to measure attitude in different fields: education, commerce, engineering, management, marketing, and other consumer-related issues. In this context, the objective of this research is to construct and standardize the attitude scale to measure the attitude of school teachers towards the teaching profession.

Literature shows a huge deal of research related to attitudes in diverse fields. Hellfritzsch (1945) demonstrated the importance of attitudes toward teaching almost 75 years ago. Recently, Stronge (2002) has shown that attitudes like caring, fairness, respect for students, peers, parents, and community, enthusiasm, motivation, and dedication to teaching are necessary for pre-service teachers to become successful teachers (as cited in Casey and Childs, 2007, p. 4).

Azeem, Mahmood, Rehman, Afzal, Muhammad, and Idrees (2009) constructed an attitude scale to measure pre-service teachers' attitudes towards the teaching profession in Lahore, Pakistan. The primary objective of this study was to develop an attitude scale for the measurement of the professional attitude of prospective teachers towards teaching. The design of the study was descriptive in nature (p. 180). A sample of 115 was selected randomly out of a total of 161 students. A 6-point Likert-type scale consisting of 49 items with nine negative and other positive statements was developed by the researchers, which was reduced to 30 items after piloting. The reliability coefficient Cronbach Alpha was 0.85 (p. 182). The six experts validated this scale (p. 183).

Another research was made by Hussain, Jamil, Noor, Sibtain, and Shah (2011) on the problem of the relationship between the Professional Attitudes of Secondary Schoolteachers and Their Teaching Behavior in Pakistan. A sample of 50 teachers and 100 students from Dera Ismail Khan City was selected. Two Likert-type scales (attitude scale and teaching behavior scale), each containing 30 statements, were used to collect necessary data. The mean and standard deviation for the attitudes of teachers were 3.70 and 0.702, while the same statistics for the behavior of the teachers were found to be 3.90 and 0.712.

Alkhateeb (2013) conducted a study to identify the attitudes of education students towards the teaching profession in Qatar. Two research questions and a quantitative approach guided the study and were used to analyze the data. The unidimensional, 34-item 5-point Attitude Scale towards Teaching Profession was used to measure the attitude. A sample of 334 undergraduate students majoring in education was selected, out of which 216 (64.7%) of the students indicated their GPAs were 3.00 or higher, and 17 (5.1%) reported their GPAs were 2.00 or lower.

Professional attitudes of prospective teachers enrolled in public and private institutions were compared by Riaz, Habib, Riaz, and Uzair-ul-Hassan (2013) in Punjab (Pakistan). A sample of 240 prospective teachers of the B. Ed. session 2012-2013 (120 from public teacher training institutions and 120 from private teacher training institutions) was selected using the convenience sampling technique. "Attitude Scale

Towards the Profession of Teaching," developed by Ustuner (2006), was used to collect the required data (p. 280). This tool was comprised of a single-dimensional Likert-type scale with 5 points and 34 items. Its concurrent validity was 0.89, its reliability coefficient in terms of its score stability was .72, and its internal reliability coefficient, Cronbach Alpha, was .93. Mean, standard deviation, and t-test were used as statistical techniques, and collected data were analyzed through SPSS software (pp. 281-283).

Mehmood, Akhter, Ch, and Azam (2013) conducted a study on the Attitude of Prospective Teachers Towards the Profession- A Measure for Institutional Development. The objective of this study was to measure the professional attitude of the Master level students of Institutes of Education and Research and University of Education Lahore (Pakistan) and compare the attitudes on the basis of gender, teaching experience, age groups, educational backgrounds, and parents' educational career. A sample of 150 students was randomly selected, and a Likert Scale with 20 statements related to job, teaching profession, social status, and economic status was self-constructed by the researchers to collect the data. Data was analyzed by statement-wise frequency distribution (on five points, strongly disagree to agree strongly) and percent analysis. A self-constructed Likert-type scale comprising 20 statements was used in this study. Steps of standardization were not followed to construct the attitude scale.

Another study on Attitudes toward the teaching profession was conducted by Andronache, Bocos, Bocos, and Macri (2014) in Romania. A sample of 82 students of Masters in Science Education was selected. Out of them, 72% of the participants are licensed in educational sciences, and 64% of them came from urban areas. The average age of participants was M = 23.81 years. A correlational design was used to identify the relationship between the components of attitude (cognitive, affective, and behavioral) (p. 629). A Likert Scale with 5 points containing 34 items was used to identify future potential teachers' attitudes toward the teaching profession. Mean, standard deviation, and Pearson correlation were used as statistical techniques. IBM SPSSTM software was used to analyze the obtained data (p. 630).

An attitude scale was constructed by Renthlei and Malsawmi (2015) to measure the attitude of schoolteachers in the state of Mizoram (India) towards the teaching profession. This scale is comprised of 126 statements related to classroom teaching, financial aspects, social aspects, academic responsibility, the personality of the teachers, the value system of the teachers, and professional growth. Altogether, 22 statements (10 positive and 12 negative) were included in the final scale. Split-half reliability and concurrent validity were found at .69 and .84, respectively (pp. 29-31).

An assessment of prospective teachers' attitudes toward the teaching profession was done at Northwest University, Kano-Nigeria, by Musa and Bichi (2015). This study aimed to determine the attitudes of student teachers attending teacher-training programs in the Faculty of Education at Northwest University, Kano, towards the teaching profession. This study also intended to determine whether the attitudes of the prospective teachers towards the teaching profession differ according to some variables, including gender, program of study, and level of study (p. 19). A quantitative descriptive survey design was used in this study. A sample of 220 (116 males and 104 females) was selected by using a stratified random sampling method for the departments, programs, and levels. Professional Attitude Scale for Prospective Teachers (PASPT) based on a 5-point Likert response mode developed by the researchers (with 15 items, nine positive and six negative) was used to collect necessary data. The coefficient of reliability (Cronbach's alpha) of the attitude scale was 0.78. The mean attitude of the prospective teachers towards the teaching profession and standard deviation were 3.41 (out of a total score of 5) and 0.869, respectively.

Soibamcha (2016) conducted a study to identify the attitude of teachers towards the teaching profession in Imphal West District, Manipur (India). The objective of this study was to test two hypotheses: teachers' educational qualifications and attitudes toward the teaching profession are independent, and age has nothing to do with attitudes toward the teaching profession. This research was based on a case study approach under a normative survey. A sample of 150 teachers (75 males and 75 females) from 15 government and 15 private secondary schools was selected by using the simple random sampling technique. The mean and SD ages of the teachers were 39.48 and 10.21, respectively. To collect the required data, the Teacher Attitude Inventory (TAI) developed by Ahluwalia (2006) was used. This inventory is a Likert-type scale comprising 56 positive and 34 negative items, altogether 90 items within six sub-scales.

Further, this scale consists of 43 items measuring the attitude in favorable directions and 47 in unfavorable directions. Its reliability was 0.88. The chi-square test and percentage were used as statistical techniques to analyze the data (p. 104).

Generally, the attitude scale is used in quantitative research design. So, statistical techniques such as percentages, t-tests, chi-square tests, percentiles, and z-scores are used to interpret the results of the attitude scale. Similarly, one more concept, the Relative Importance Index (RII), is also used to interpret the importance or quality of the factors associated with the corresponding variable. RII is used to determine the relative importance of quality factors involved (Azmon et. al, 2019, p. 2). Thus, RII is a technique to find out the importance of statements specially used in Likert's type

scale. It is used to determine the relative importance of quality factors involved and also used as a method to prioritize the project risk factors. RII approach is used to describe the relative importance of the specific causes and effects based on the likelihood of occurrence and effect on the project using the Likert scale of five scales (Aibinu & Jagboro, 2002, p. 444).

The Likert scale is a data collection tool used to know the opinions/views of respondents. In this tool, a number of statements are prepared related to any particular topic generally with five options: Strongly agree, Agree, Neutral/undecided, Disagree, and Strongly disagree. These options are given scores of 5,4,3,2 and 1, respectively. The value of RII ranges from 0 to 1. As the value increases, the importance of the statement also increases, i.e., the higher the value, the higher the importance of the statement.

Relative Importance Index (RII) is calculated by using the following formula:

$$RII= (5n_5+4n_4+3n_3+2n_2+1n_1)/(A\times N) \quad \text{……..1}$$

Where, n_5 = Number of respondents for Strongly Agree

n_4 = Number of respondents for Agree

n_3 = Number of respondents for Undecided

n_2 = Number of respondents for Disagree

n_1 = Number of respondents for Strongly Disagree

A = Number allotted for Strongly Agree (Highest weight)

N= Total number of respondents

To understand the concept of RII, the following piece of scale comprising five statements related to construction engineering can be considered:

Table 1

Statements and their RII values with ranks

S. No.	Statements	Strongly Agree (n_5)	Agree (n_4)	Undecided (n_3)	Disagree (n_2)	Strongly Disagree (n_1)	Values of RII	Rank
1	Safety signages are installed at the work site	4	15	2	7	2	0.68	3
2	Workers are provided with sufficient Personal Protective Equipment	1	6	0	20	3	0.48	4

3	There is a facility for the systematic storage of materials at the construction site	8	14	3	4	1	0.76	2
4	Workers are provided with immediate first-aid treatment in case of an accident	0	3	6	15	6	0.44	5
5	There are safe entry and exit points in case of any severe hazard	10	14	0	6	0	0.79	1

Here, the highest value of RII is 0.79 for the statement. *There are safe entry and exit points in case of any severe hazard.* It shows that in this construction site, the most important quality factor is that the site is provided with properly safe entry and exit points so that workers can exit from the workplace safely in case any severe disaster occurs. Similarly, the lowest value of RII is 0.44 for the statement *Workers are provided with immediate first aid treatment in case of any accident*. This statement is given the lowest rank of 5 and indicates that there is a lack of facility for workers to get immediate first aid treatment in case any accident takes place. Other statements can be interpreted in a similar way. This concept of RII can be used to identify the relative importance of statements of the Likert-type scale related to education and other fields/ variables.

Literature shows that construction and implementation of attitude scales to identify the attitude of teachers towards teaching profession is rarely found in context of Nepal. Which was considered as the research gap for this study. This study was guided by the research question: what is the attitude of schoolteachers towards teaching profession?

Methodology

This study was conducted to construct and standardize a Likert type attitude scale for schoolteachers to measure their attitude towards teaching profession. Three districts of Nepal (Kanchanpur, Kathmandu and Bhaktapur) and two districts (Champawat and Udham Singh Nagar) from India were selected as the locale of the study. Quantitative design was adopted as research design and survey method was used to collect the necessary data. A sample of 374 schoolteachers of 47 government schools was selected by using systematic random sampling technique. A draft attitude scale comprising 40 bilingual (Nepali and English) statements was used to collect data for further analysis.

Results and Discussion

Construction of the Draft Scale

Statements for the attitude scale should be constructed by keeping some criteria in mind: statements should not be based on factual things as persons with different opinions respond in similar ways to factual things; statements should be clear, concise, and straight forward; statements should be so constructed that the modal reactions spread all over the attitude continuum, equal number of the statements should be constructed in favor and disfavor, and if multiple choice statements are used, the different alternatives should involve only a single attitude variable and not several (Likert, 1961, p. 90-91).

Initially 50 statements based on various aspects like responsibility, politics, satisfaction, livelihood, interest, prestige, salary, career development, difficulties in profession, creativity, involvement and national priority were constructed. These statements were given to four experts (two from Nepal and two from India). On the basis of valuable suggestions of the experts, 10 statements were rejected and a draft was prepared including 40 statements out of which 24 were favorable (Positive) and 16 were unfavorable (Negative) towards teaching profession. Here, the statement which was in favor of the teaching profession, considered as favorable or positive statement and the statement not in the favor of teaching profession was taken as unfavorable or negative statement. Two separate scales with same statements were developed for Nepal and India.

As this attitude scale was constructed to measure the attitude of teachers of Nepal and India, two sets of bilingual scales were developed. One set was developed in Nepali and English language and other was in Hindi and English language. These sets were provided to experts of Nepali, Hindi and English languages for grammatical and linguistic correction.

Piloting

To standardize the attitude scale, researcher carried out a pilot study on a sample of 374 schoolteachers of five districts. The sample was taken from both Nepal and India to standardize the attitude scale so that the scale can be used in both countries and cultural and demographic effects on the measurement of attitude can be minimized. Random sampling technique was used to select the teachers from three districts Kanchanpur, Kathmandu and Bhaktapur of Nepal, and Chapmawat and Udham Singh Nagar of India. Randomly selected sample comprised 248 male teachers and 126 female teachers of 47 government schools (36 secondary schools out of which 29 were from Nepal and each

school includes junior secondary and primary level, 8 junior secondary/basic schools and 3 primary schools). Attitude scales with 40 statements were given to teachers and collected next day.

Scoring

Scoring and interpretation can be made by using sigma units, assuming that attitudes are distributed normally. Another simpler method can also be used in which result is interpreted by assigning the numerical values to the responses and just computing the sum of the scores or their average (Likert, 1932, p. 42). In this study, out of 40 statements, 24 statements were positive (favorable) and 16 statements were negative (unfavorable). After collecting the attitude scale, scoring was made on the basis of direction of the statements. For favorable statements, scores were given 5,4,3,2 and 1 according to the degree of agreement that is strongly agree to strongly disagree and unfavorable statements were scored just opposite to the favorable statements that is scores 1, 2, 3, 4 and 5 were given to strongly agree to strongly disagree.

Item Analysis

According to Singh (2006, p. 47) "Item analysis is a technique through which those items which are valid and suited to the purpose are selected and the rest are either eliminated or modified to suit the purpose". Generally, difficulty level, power of discrimination, and power of distracters are computed to analyze the appropriateness of items in quantitative item analysis. But tool used in this study was attitude scale and attitude scale include statements as test items. These statements have neither difficulty level nor power of distracter; statements have only power of discrimination. To identify the discrimination power of statements on the basis of *t*-value, Edwards (1957, p. 153) suggested the following formula:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}{N(N-1)}}} \qquad \ldots\ldots\ldots\ldots\ldots\ldots 2$$

Where X_H = The score of a given individual for a given statement in the higher group.

$\overline{X}_H$ = The mean score of the higher group for a given statement.

X_L = The score of a given individual for a given statement in the lower group.

$\overline{X}_L$ = The mean score of the lower group for a given statement.

N = Number of subjects in the criterion group.

After replacing $\sum (X_H - \overline{X}_H)^2$ by $N\sigma_H^2$ and $\sum (X_L - \overline{X}_L)^2$ by $N\sigma_L^2$ formula 2 can be simplified as:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sigma_H^2 + \sigma_L^2}{N-1}}} \quad \text{..... 3}$$

But, generally, formula 3 is used for small samples, and the following formula is used for large samples:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sigma_H^2}{N_H} + \frac{\sigma_L^2}{N_L}}} \quad \text{..... 4}$$

Again, for $N_H = N_L = N$,

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sigma_H^2 + \sigma_L^2}{N}}} \quad \text{..... 5}$$

Using formula 5m, discriminating power of all the 40 statements was calculated by taking 27% of the total students that is 101 students as higher group and an equal number of students as lower group. MS Excel was used to compute the *t*-values, which are presented in the table 2.

Table 2

Description of t-values of the statements of attitude scale

Statement No	*t*-values	Remarks	Statement No	*t*-values	Remarks
1	5.684	Accepted	21	8.578	Accepted
2	2.697	Accepted	22	7.605	Accepted
3	10.200	Accepted	23	5.615	Accepted
4	11.523	Accepted	24	11.948	Accepted
5	5.886	Accepted	25	10.862	Accepted
6	6.874	Accepted	26	10.288	Accepted
7	8.796	Accepted	27	2.443	**Rejected**
8	12.971	Accepted	28	6.386	Accepted
9	5.346	Accepted	29	8.459	Accepted
10	5.481	Accepted	30	8.953	Accepted
11	1.621	**Rejected**	31	11.656	Accepted
12	2.298	**Rejected**	32	4.515	**Rejected***

13	10.362	Accepted	33	2.927	**Rejected***
14	6.601	Accepted	34	9.193	Accepted
15	11.162	Accepted	35	2.546	**Rejected**
16	11.641	Accepted	36	11.667	Accepted
17	9.525	Accepted	37	11.060	Accepted
18	0.000	**Rejected**	38	3.285	Accepted
19	5.629	Accepted	39	10.612	Accepted
20	2.567	**Rejected**	40	7.320	Accepted

Here, *t*-values of the statements are ranging from 0.000 to 11.948. Critical value for two-tailed test and degree of freedom (*df*) = 101 + 101 – 2 = 200 at 1% level of significance (α = 0.01) is 2.601. It means the items whose *t*-values are greater or equal to 2.601 are significantly discriminated the respondents having high and low attitude towards teaching profession. Statement number 11, 12, 18, 20, 27 and 35 having *t*-values less than 2.601 were rejected on the basis of item analysis because these statements were unable to discriminate the respondents having high and low attitude. Again starred (*) statement number 32 and 33 were rejected (although their *t*-values were greater than critical values) on the basis of suggestions provided by respondents during the data collection. Thus, total eight statements were rejected on the basis of item analysis and respondents' suggestions out of which seven statements were positive and one statement was negative.

Construction of the Final Scale

After item analysis of the statements, 32 statements were accepted out of which 17 statements were positive and 15 statements were negative in polarity. Thus, final attitude scale was constructed containing 32 statements. Two separate bilingual sets (Nepali-English and Hindi-English) were developed so that the scale can be equally used in both countries. Title of the attitude scale "Attitude of Teachers towards Teaching Profession", demographic and other information of the respondents, purpose of the test, method of giving response and request note are kept on cover page of the scale.

Reliability and Validity

Reliability

Reliability is one of the most important technical properties of a test. According to Linn and Miller (2013, p. 104) "Reliability refers to the consistency of measurement, that is, how consistent test scores or other assessment results are from one measurement to other." Thus, if any test gives consistent scores when administrated repeatedly it

can be considered as reliable test. Reliability of this attitude scale was estimated by split-half, test-retest and Cronbach alpha methods. Short description of each type of estimation of reliabilities are given below:

Split-half Reliability. Split-half reliability of final test with 32 statements was found .767 using MS Excel.

To obtain the reliability of the full test following Spearman-Brown Prophecy formula (Linn and Miller, 2013, p. 110) was used.

$$r_{tt} = \frac{2r_{1/2}}{1 + r_{1/2}} \quad \text{..... 6}$$

Here,

r_{tt} = reliability of the full test.

and, $r_{1/2}$ = reliability of the half test.

Putting the value of $r_{1/2}$ (.767) in the formula 6, reliability of the full test was found .868.

Test-retest Reliability. To compute the test-retest reliability of the final scale, test was re-administrated on 101 teachers and both set of the scores were correlated. Pearson's r was found .800 that is test-retest reliability of the final attitude scale was estimated as .800.

Cronbach's Coefficient Alpha. To estimate the reliability of the attitude scale based on internal consistency of the test, coefficient alpha was computed using formula 7 (Cronbach, 1951; Kaiser and Michael, 1975 as cited in Singh, 2006, p. 81):

$$r_{tt} = \alpha = \left(\frac{N}{N-1}\right)\frac{\sigma_t^2 - \Sigma(\sigma_i^2)}{\sigma_t^2} \quad \text{..... 7}$$

Here,

$r_{tt} = \alpha$ = reliability of the full test.

N = Number of items in the test.

σ_t^2 = Variance of all scores on the test.

σ_i^2 = Variance of all individual scores in each item.

Using Excel spreadsheet, value of coefficient alpha was calculated as $\alpha = 0.845$.

Thus, these all types of reliabilities are indicating that the tool constructed is very highly reliable.

Validity

Validity is an important factor for effective research because invalid research is worthless (Cohen, Manion and Morrison, 2010, p. 133). Two types of validities were estimated for this attitude scale.

Content Validity. If the test covers fairly and comprehensively the domain or items that it purports to cover, then the test is said to have content validity (Cohen, et al, 2010, p. 137). The four experts of the subject area established content validity and precision of the items were established by three experts of related languages.

Twenty Seven Percent Upper and Lower Group Method. In this method, two groups of 27% of total respondents having higher attitude and lower attitude were selected and *t*-test was used to check whether the difference of mean attitude scores of these two groups was significant or not. SPSS results of *t*-test are presented in table 3.

Table 3

SPSS Results of t-test for Validation of Attitude Scale

t-test for Equality of Means						
t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
					Lower	Upper
34.538	200	.000	38.69307	1.12030	36.48394	40.90219
34.538	193.053	.000	38.69307	1.12030	36.48346	40.90268

From table 3, *t*-value is 34.538, *df* is 200 and p-value for two-tailed test is 0.000. This result implies that the difference of mean attitude scores of upper group and lower group is significant at 0.01 level of significance. This significant difference indicates that the scale is capable to discriminate the respondents having higher and lower attitude. Thus, both methods content validity method and upper-lower group validity method are clearly indicating the validity of the whole test.

Descriptive Statistical Values and Normality of the Scores of Attitude Scale

Descriptive statistical values (obtained by SPSS version 21) of all 374 scores of attitude test with 32 statements are presented in the table 4.

Table 4

Descriptive Statistical Values of Attitude Scores

		Statistic	Std. Error
Attitude score	Mean	99.3021	.82653
	Median	99.0000	
	Variance	255.498	
	Std. Deviation	15.98431	
	Minimum	60.00	
	Maximum	146.00	
	Range	86.00	
	Interquartile Range	23.00	
	Skewness	.114	.126
	Kurtosis	-.244	.252

Final standardized attitude scale consists 32 items. Each item has five options, and scores for these options varies from 1 to 5. Thus, minimum possible score for each item is 32 and maximum possible score is 160. Highest and lowest scores obtained in this test were 146 and 60 respectively (table 3). The mean of all scores is 99.302, and SD is 15.984. Values of skewness and kurtosis are .114 and –.244; again, their respective standard errors are .126 and .252, respectively. If the absolute value of skewness or kurtosis is less than 1.96 (≈ 2) times the values of their respective standard errors, then the distribution can be considered as normally distributed (Field, 2016, p. 11). Values of skewness, kurtosis, and their respective standard errors are clearly showing that these scores are typically distributed.

Table 5

Test of Normality of Attitude Scores for Construction of the Tool

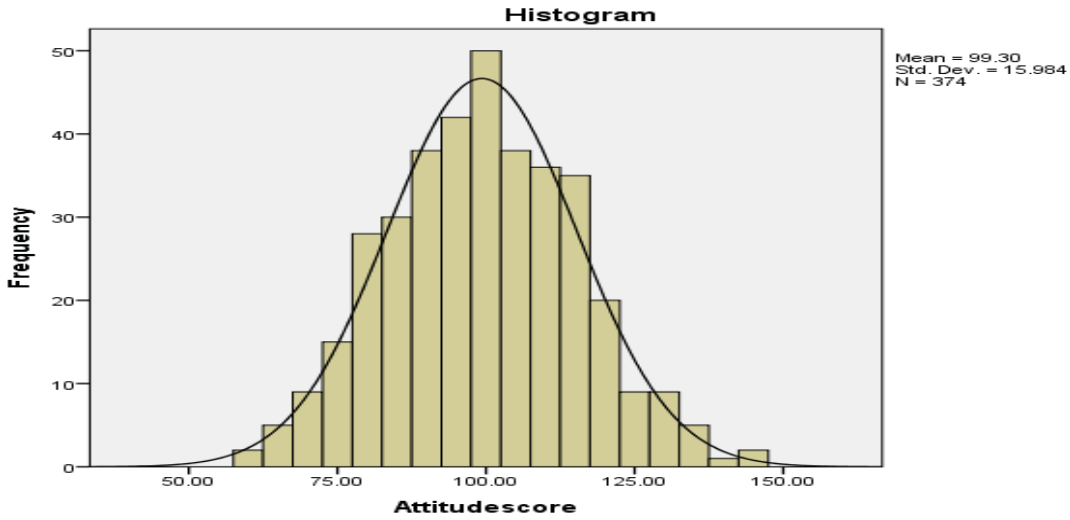
	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Attitude scores	.031	374	.200	.996	374	.463

Results of Kolmogorov-Smirnov and Shapiro-Wilk tests of normality obtained by SPSS version 21 are presented in table 5. In this study, the sample size was more than 50 (N = 374); therefore, the Kolmogorov-Smirnov test was used to determine the normality of the distribution (Tyagi, 2019 a, p. 6). Here, the test statistic is .031 for *df* 374 while the value of significance is .200. As the p-value is greater than 0.05, the difference is not significant. That is, the null hypothesis, "The distribution of given

scores is not significantly different from normal distribution," is accepted that the scores of attitude scale are normally distributed.

Figure 1

Histogram and Normal Probability Curve of Attitude Scores



The Histogram and curve of attitude scores in Figure 1 also clearly indicate that the scores are normally distributed.

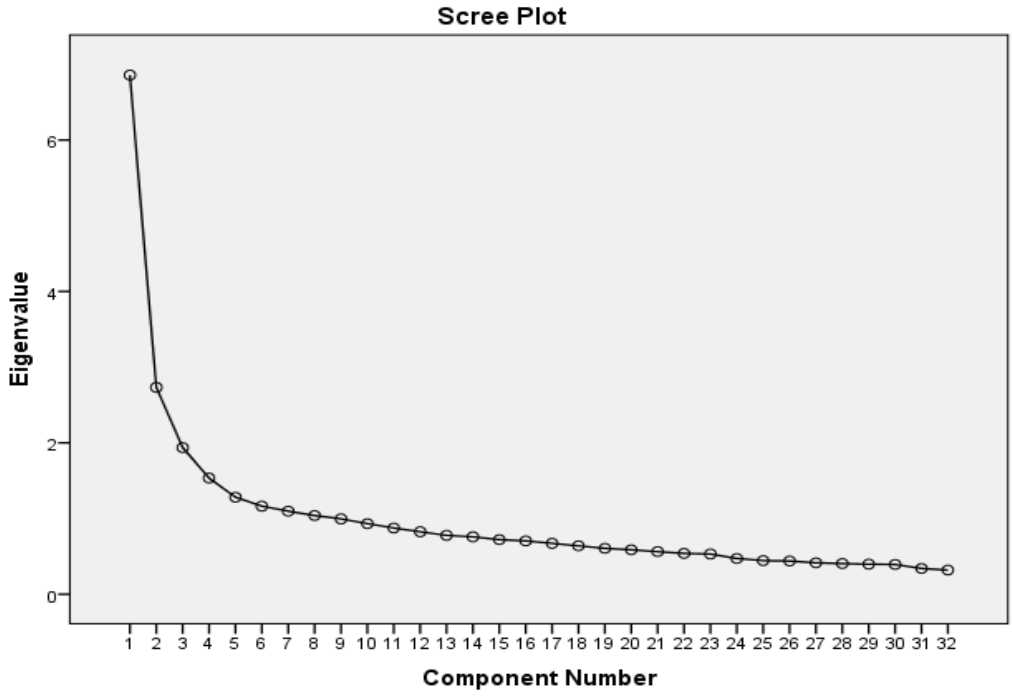
Factor Analysis of Attitude Scale

After constructing the final attitude scale with the 32 most appropriate statements, factor analysis was made to extract some factors related to these statements. Factor analysis is developed for analyzing the inter-correlations within a set of variables so that all variables within a group are highly correlated but have small correlations with variables in different groups.

The value of the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO test) was found to be 0.866 (suitability range is 0.5 to 1.0), which shows that data is suitable for factor analysis. There are a number of ways to decide the method of extraction of factors and the number of factors to be extracted. In this study, factors were extracted by using the Principal Component Analysis method, and the number of factors was determined by using Eigenvalues criteria. Eigenvalue represents the amount of variance in the original variables associated with a factor. Only factors with Eigenvalues greater than 1.0 are retained. A schematic plot for component numbers and Eigenvalues is given in Figure 2. From figure 2, it is clear that there are eight components whose eigenvalues are greater than 1.0.

Figure 2

Scree Plot of the Statements Based on Eigen Values



To get the sharp grouping of variables, Varimax with the Kaiser Normalization method was used. The results obtained are presented in table 6.

Table 6

Correlation of Statements within and between Factors

Rotated Component Matrix								
	Components							
	1	2	3	4	5	6	7	8
S14	.709	.001	-.034	.129	.165	.107	.096	.057
S19	.661	.109	.195	.027	-.025	.007	.018	.166
S8	.653	.171	.123	.153	-.029	.093	.067	.302
S28	.640	.146	.131	.398	-.010	.062	.113	-.181
S20	.637	.104	.086	.341	.055	.242	-.153	.067
S23	.132	.710	.188	-.030	.040	-.137	-.090	-.157
S17	.126	.663	.124	-.008	.299	-.040	.069	.025
S21	.084	.635	.207	.125	.295	.162	-.027	-.029
S24	.046	.618	-.026	.182	-.080	.134	.183	.239

S22	.171	.534	-.005	-.056	.058	.098	.339	.279
S29	.121	.146	.682	.070	.173	.171	-.046	.043
S10	.173	.099	.666	.092	.149	.116	-.161	.112
S9	.096	-.021	.597	.042	.209	-.178	.086	-.042
S26	.004	.441	.581	.133	.074	.015	.121	.050
S5	-.007	.267	.453	.312	.280	.096	-.086	.033
S32	.187	-.050	.094	.714	.109	-.025	.024	.010
S31	.338	.072	.062	.613	-.006	-.050	.199	.121
S15	.141	.109	.153	.513	.430	.117	-.098	.092
S12	.100	.128	.044	.445	-.020	.407	-.242	.124
S27	.070	.064	.416	.438	-.123	.249	.233	.135
S13	.215	.267	.207	.391	.019	.327	-.210	.287
S11	-.097	.247	.112	.069	.645	-.027	.053	-.241
S2	.083	-.016	.334	.087	.624	.128	.124	.264
S1	.239	.015	.221	-.081	.609	-.049	.083	.087
S16	-.079	.322	.071	.087	.507	-.054	-.108	-.044
S18	.123	-.035	.003	.081	.098	.793	-.049	.078
S4	.112	.053	.105	-.019	-.085	.767	.098	.023
S30	.083	.081	-.011	.185	-.077	.055	.699	-.285
S3	-.026	.027	-.078	-.084	.091	-.139	.617	.265
S25	.245	.295	.211	-.055	.133	.148	.423	.056
S6	.292	.101	.062	.073	.056	.175	.128	.604
S7	.135	.010	.149	.427	-.055	.011	-.121	.588

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]
a. Rotation converged in 9 iterations.

Rotated component matrix is clearly showing 8 factors on the basis of correlation of the statement with factors. First factor includes five statements with the correlation range .709 to .637. Similarly, second and third factors again each comprises five statements while fourth factor includes highest number of statements that is six statements. Again, fifth and seventh factors each include three statements, and least numbers of statements (two in each factor) are associated with sixth and eighth factors.

The correlation coefficients of all 32 statements with 8 factors are given in table 6. On the basis of correlation, eight factors were extracted and labeled as given in the table 7.

Table 7

Factor Wise Statements and their Labeling

Factors	Statements	Labeling
F_1	14, 19, 8, 28 and 20	Responsibility and politics
F_2	23, 17, 21, 24 and 22	Satisfaction and livelihood
F_3	29, 10, 9, 26 and 5	Interest and prestige
F_4	32, 31, 15, 12, 27 and 13	Salary and career development
F_5	11, 2, 1 and 16	Involvement and future perspective
F_6	18 and 4	Difficulty in profession
F_7	30, 3 and 25	Creativity
F_8	6 and 7	National priority

Norms and Interpretation

To interpret the results of this study, two types of norms were developed.

Z-score Norms

Scores of attitude scale are normally distributed so concept of z-score can be used here for best interpretation of the result. Z-scores of each individual raw score were calculated by using formula 8.

$$\text{Z-score} = (X-\overline{X})/\sigma \quad \ldots\ldots\ldots\ldots\ldots\ldots 8$$

Here,

X = Individual score of respondents

$\overline{X}$ = Mean of all scores

σ = Standard deviation of all scores

Z-scores of all raw scores were computed by using Excel spreadsheet and were found ranging from –2.458 to 2.921. Seven categories of z-score norms were developed and presented in the table 8.

Table 8

Z-score Norms and Interpretation for Attitude

Range of z-scores	Interpretation
+2.16 and above	Extremely favorable
+1.39 to below +2.16	Highly favorable
+0.62 to below +1.39	Favorable
-0.15 to below +0.62	Neutral

-0.15 to below +0.62	Neutral
-0.92 to below -0.15	Unfavorable
-1.69 to below -0.92	Highly unfavorable
Below -1.69	Extremely unfavorable

Percentile Norms

To develop five-category percentile norms, values of the percentiles P_{20}, P_{40}, P_{60} and P_{80} were calculated. Categories to interpret the test results are presented in the table 9.

Table 9

Percentile Norms and Levels of Interpretation

Percentiles	Score range	Interpretation
$P_{80} = 113$	113 and above	Highly favorable
$P_{60} = 103$	103 to 112	Favorable
$P_{40} = 94.2 \approx 95$	95 to 102	Neutral
$P_{20} = 85$	85 to 94	Unfavorable
	84 and below	Highly unfavorable

No time limit was given to fill this attitude scale; however, researcher made a small study on time required to fill this scale and found that average time required for this scale was 16 minutes; 5 minutes for front page information and 11 minutes for responding 32 statements.

Conclusion

An attitude scale comprising 32 statements has been designed for schoolteachers to identify their attitude towards teaching profession. Diverse sample was used to reduce the geographical and cultural effects. Test was constructed by subjecting it under the steps of test standardized procedure. Reliability and validity of the test were established by item analysis and subject expert judgement. Values of split-half, test-retest and Cronbach alpha reliabilities were found in the range of .80 to .87 which ensure the high reliability of the test. Almost equal number of favorable and unfavorable statement were selected to minimize the consistent response of the respondents. All 32 statements are also categorized in 8 factors by using Principal Component Analysis method. Two types of norms: z-score norms with seven interpreting categories and percentile norms with five interpreting categories were developed to interpret the results of attitude scale. The researchers can use this attitude scale in the Indo-Nepalese context to identify the attitude of schoolteachers towards the teaching profession. To get a standardized attitude scale, researchers can contact authors.

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