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Prospective Teachers' Academic Honesty Scale - Development using

Exploratory Factor Analysis (EFA)

M. Dona Amalorpavam* and I. Muthuchamy*

Abstract

The quality education that one receives should ensure him/her to follow honesty in all walks of life. This is possible only when the environment of honesty exists in all the academic activities of the educational institution. First the teacher should follow the honesty in academic activities. It should be nurtured with more emphasis in teacher preparation itself. Hence it is necessary to measure the levels of academic honesty among the prospective teachers in order to frame academic honesty policy for both in school education and teacher education. Hence a scale to measure academic honesty of prospective teachers. Is more warranted. This study utilized exploratory research design. The data were collected from 404 prospective teachers of the State of Tamil Nadu. The results of data analysis using SPSS ver. 22 has identified four factors viz., Cheating during and after Examination, cheating during Examination with Neighboring Candidate, Falsification and Plagiarism and Cheating Prior to the Examination, to measure the academic honesty of prospective teachers. The reliability and validity of the scale have been established.

Keywords: Academic Honesty, Prospective teachers, Exploratory Factor Analysis

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Research Scholar, Department of Educational Technology, Bharathidasan University, Tiruchirappalli, Tamil Nadu, India

**Professor & Head, Department of Educational Technology, Bharathidasan University, Tiruchirappalli, Tamil Nadu, India*

INTRODUCTION

Every nation expects its citizen should be honest. Honesty is being first inculcated by the family members to the child. Later it is being strengthened or refined into the desired direction by education. Education cultivates the human beings. The cultivated human beings do the

work with integrity. The teacher acts as role model to the students in developing honesty in all types of academic activities including online academic activities. The teacher trainees who become future teachers should have adequate level or more level of honesty in their academic activities.

ACADEMIC HONESTY

Academic honesty refers to demonstrating and upholding integrity and honesty in all academic works that learner does. Academic honesty is one of the core values of academic integrity. It is also stated in opposite way like academic dishonesty or academic misconduct. Kibler, Nuss, Paterson and Pavela (1988) stated that academic dishonesty has been classified into four categories: not being involved in cheating, fabrication, facilitating academic dishonesty, and plagiarism. According to Arent (1991) and Pratt & McLaughlin (1989) Students' academic dishonesty includes right from lying to cheating on exams, to copying or using other people's work without permission, shifting or forging documents, buying papers, plagiarism, purposely not following the rules, shifting research results, providing false excuses for missed tests and assignments, making up sources, and so on. According to McCabe and Bowers, (1994) academic dishonesty is based upon a particular violation behavior, such as cheating in a test or plagiarism. Newstead, *et al.*, (1996) and Graham, *et al.*, (1994) pointed out that academic dishonesty is an injury to academically honest students as well as faculty /teacher whose purpose is to teach. Hard, Conway and Moran (2006) defined Academic misconduct as 'providing or receiving assistance in a manner not authorized by the instructor in the creation of work to be submitted for academic evaluation including papers, projects and examinations (cheating); and presenting, as one's own the ideas or words of another person or persons for academic evaluation without proper acknowledgement (plagiarism)' (p. 1059).

FACTORS OF ACADEMIC DISHONESTY

The factors of Academic dishonesty have been identified by many researchers. A few have been described in this section. Gallant (2008) has described five categories of academic dishonesty viz., Plagiarism, Fabrication, Falsification: Misrepresentation and Misbehavior. Munir, Ahmad and Shahzadi (2011) have identified eight factors for the occurrence of academic cheating viz., Plagiarism, Fabrication, Cheating, Sabotage, Outside Help, Electronic Cheating, Unethical Behavior, and Free-Rider. Katoch (2013) have considered nine factors for the occurrence of academic cheating namely. Cheating, Fabrication, Facilitating Academic Dishonesty, Plagiarism, Multiple Submissions, Abuse of Academic Materials, Deception & Misrepresentation, Electronic Dishonesty and Carelessness.

NEED AND SIGNIFICANCE

An intentionally unethical behavior academic dishonesty has been defined by various authors almost with the same core values. It includes cheating, falsification, getting help from others and plagiarism. That means upholding honesty in getting admission, participation in classroom activities and classroom examinations, preparing and submitting assignments and projects etc., before, during and after Board or semester examinations.

Many stakeholders of the educational system are concerned with the problem of academic dishonesty and the rate at which it is increasing (Ameen, *et al.*, 1996). This leads to not only the emergence of unhealthy situation in the nation but also in the future growth of the nation. Hence the policy makers have taken measures to strengthen academic honesty. In India also the University Grants Commission in higher education and the various boards of school education have also formulated academic honesty policies and advised all kinds of educational institutions to adhere to them strictly. But the success of the policy depends on the implementers namely the teachers. In the teacher education programme care should be taken to develop, or imbibe such an honest quality. The future teacher that is the B.Ed. Trainees should have thorough understanding of qualities of academic honesty. In general, a few researches have been done to try and identify variables that have an effect on academic dishonesty. (Caruana, *et al.*, 2000). But in teacher education there is a scarcity of research to identify variables that have an effect on academic honesty. Hence in this study the researchers tried to identify the constructs for academic honesty of the B.Ed. trainees using Exploratory Factor Analysis (EFA) which is more warranted.

OBJECTIVES OF THE STUDY

The main objective of this study are as follows:
1. To construct a tool for measuring the Academic Honesty of B.Ed. Trainees
2. To validate the Academic Honesty Scale for B.Ed. Trainees

METHODOLOGY IN BRIEF

Researcher adopted exploratory type of research. Explanatory research focuses on studying a situation or a problem in order to explain the relationships between variables. (Saunders *et al.*, 2007). Exploratory Factor Analysis (EFA) is a process of determining factors, concerning the relationships between variables and creating a theory (Rustico and Jerusalem, 2020). In this study of scale development, the following seven stages viz., Identification of the dimensions of Academic Honesty, Item pool generation, Determination of the measurement scale, Expert review of the initial item pool, Revision and inclusion of items, Administration of the items to a sample and Evaluation of the items were followed:

SAMPLE

In order to test the reliability and validity of a developed tool, a survey was administered to 410 B.Ed. Trainees. Out of 410 after eliminating respondents whose responses had missing values the final sample size was 404. This is more than 10 times of number of initial items (28) selected for factor analysis.

DEVELOPMENT OF TOOL

To achieve the above said objectives, the researcher followed the under mentioned procedure in developing the research tool.

STEP 1: IDENTIFICATION OF THE DIMENSIONS OF ACADEMIC HONESTY

A review of literature that was retrieved from scientific databases was conducted to identify factors that influence the academic honesty. An informal interview was also adopted to finalize the dimensions. The interview was composed

of guide questions designed to elicit responses on academic honesty followed by B.Ed. trainees. The outline included an engaging question, exploratory questions, and an exit question. The identified eight dimensions were Falsification, cheating in the Classroom Activities, cheating before the Examination, cheating during the examination, cheating after the Examination, Plagiarism, Getting Help from Authorities, and doing Other Unfair Activities.

STEP 2: ITEM POOL GENERATION

An initial pool of 50 items was generated based on content that was identified by means of literature reviews and interviews. These items were classified into the above said eight dimensions. An easy-to-use dichotomous scale (i.e., yes-no; yes=1, no=0) was employed to record the participant responses to each of the 60 items. The initial questionnaire was developed in the Tamil language, and the first pilot study was conducted on 200 B.Ed. Trainees to determine if respondents could accurately understand the meaning of the items. 32 Items were selected from this step.

STEP 3: DETERMINATION OF THE MEASUREMENT SCALE

In the pilot study, participant responses were recorded on a 4-point Likert rating scale, which is more likely to produce predictable and controllable results than a dichotomous scale. The scores that were assigned to each response anchor of the Likert rating scale for positively worded were as follows: 4=always, 3=often, 2=sometimes, 1=rarely, and 0=never. For negatively worded items the scores were assigned in reverse way that is 0=always,

1=often, 2=sometimes, 3=rarely, and 4=never.

STEP 4: EXPERT REVIEW OF THE INITIAL ITEM POOL

In order to examine content validity, five academicians who are experts in tool development, reviewed the initial pool of 32 items. The validity of each item was assessed and a content validity index was computed (Lynn, 1986). Items with less than 80 % 'agreement' ratings between the five experts were reviewed and revised. No one differed in the categories. Hence the identified categories were retained.

STEP 5: REVISION AND INCLUSION OF ITEMS

Based on the views and comments given by the experts, and the pilot study only four items were deleted and two items were simplified. Thus, for further analysis 28 items were selected.

STEP 6: THE SELECTION OF ITEMS FOR ADMINISTRATION OF THE TOOL

The instrument for factor analysis consisted of 28 items that were selected through literature review, content validation by experts, and pilot study.

STEP 7: EVALUATION OF THE ITEMS

There are different methods of extracting factors viz., Principal Component Analysis (PCA), Principal Axis Factoring (PAF), image factoring, maximum likelihood, alpha factoring and canonical (Tabachnick and Fidell, 2007; Thompson,2004). The choice of method of extracting factors depends upon the type of purpose of doing factor analysis that is reducing the number of variables or identifying the structural relationship between variables. The Kaiser-Meyer

Olkin (KMO) Measure of Sampling Adequacy test is used to verify the sampling adequacy for the analysis, and Bartlett's Test of Sphericity is used to determine if correlations between items are sufficiently large for EFA. Bartlett's Test of Sphericity should reach a statistical significance of less than .05 in order to conduct an EFA. Hair *et al.,* (1995) point out that the majority of factor analysts typically use multiple criteria. Many extraction rules and approaches exist including: Kaiser's criteria - eigenvalue > 1 rule (Kaiser, 1960), the Scree test (Cattell, 1966), the cumulative percent of variance extracted (Horn, 1965), parallel analysis and most importantly, theoretical interpretability (Williams et *al*., 2010). Items having factors loadings more than 0.4 are usually considered for item selection.

Parallel analysis appears to be among the best methods for deciding how many factors to extract or retain (Thompson, 2004). In parallel analysis, actual eigenvalues are compared with random order eigenvalues. Factors are retained when actual eigenvalues surpass random ordered eigenvalues. The rotational method direct oblique was used to identify the latent variables. The proportion of the total variance explained by the retained factors should also be noted. As a general rule this should be at least 50% (Streiner, 1994). Without any cross loadings, a rule of all retained factors should have at least three items with a loading greater than 0.4 was adopted in fixing the number of factors in the final analysis.

DATA ANALYSIS

The reliability and validity of the questionnaire were tested by administering the final pool of 28 items to 404 B.Ed. trainees. Data were collected using the Google's online survey platform and face to face mode depending upon the availability of B.Ed. trainees. Data was analyzed with responses provided by 404 B.Ed. Trainees using the IBM SPSS Ver.22. Before conducting the factor, analysis items were checked whether their item total correlations are greater than 0.4. Out of the 28 items 19 items have their item total correlation value greater than 0.4. Thus, the resulting tool of this stage for validation consisted of 19 items.

Preliminary Parallel analysis of 19 items under the condition of common factors analysis resulted in four factors. After fixing the number of factors as four according to Parallel analysis, preliminary factor analysis was carried out using Maximum likelihood method of factoring since in this study the focus is on identifying the structural relationship between variables. Items were checked whether all the items have communality more than 0.4. One item (Item 13, I don't put my parent's signature but get it from them only) had a communality value of 0.256 and hence it was deleted.

.   Final parallel analysis of 18 items, under the condition of common factors analysis led to the same number of four factors. The final factor analysis was carried out using Maximum likelihood method of factoring. It does not have any cross loadings. The obtained KMO value is 0.866 which is above Kaiser's recommended threshold of 0.6, shows that the sample size is adequate to perform factor analysis. Similarly, the result of Bartlett's Test of Sphericity (Chi-Square 3762.52, df 153, p<.000) also indicates that

correlations between items are sufficiently large for EFA. The obtained determinant of the correlation matrix (7.51 E^-.005) for 18 items is higher than threshold value of 0.00001 (Field, 2013). The anti-image correlation values are between .775 (Item 22, I force the candidate who is seated near in the examinational hall to solve a question & write the answer in the question paper and give it to me) and .919 (Item 3, I communicate answers to a friend during a test either by whisper or any sign language). There are 32 (20.0%) non-redundant residuals with absolute values greater than 0.05. These finding have allowed the inclusion of all the 18 variables in the factor analysis.

.   The Table 1 shows that the four factors after rotation explain 35.033%, 8.012%, 7.794% & 6.188 % variance respectively. Looking at the second elbow on the plot (Fig. 1), the scree test suggests there are four factors exist as latent variables that is the break point happened after the fourth factor, when the factor eigenvalue dropped below 1. The Figure 1 also indicates the four factors made sense in terms of variance explained.

Table 1: Factor Eigen values and Variance

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	6.797	37.761	37.761	6.306	35.033	35.033	4.944
2	2.085	11.586	49.347	1.442	8.012	43.046	3.112
3	1.629	9.052	58.399	1.403	7.794	50.840	4.599
4	1.323	7.351	65.750	1.114	6.188	57.027	3.149
Extraction Method: Maximum Likelihood							

The Table 2 indicates that none of the items have cross loadings and all the items in these four factors have factor loadings more than 0.4. It implies that the items in these four factors are practically significant in explaining the academic honesty of the B.Ed. trainees.
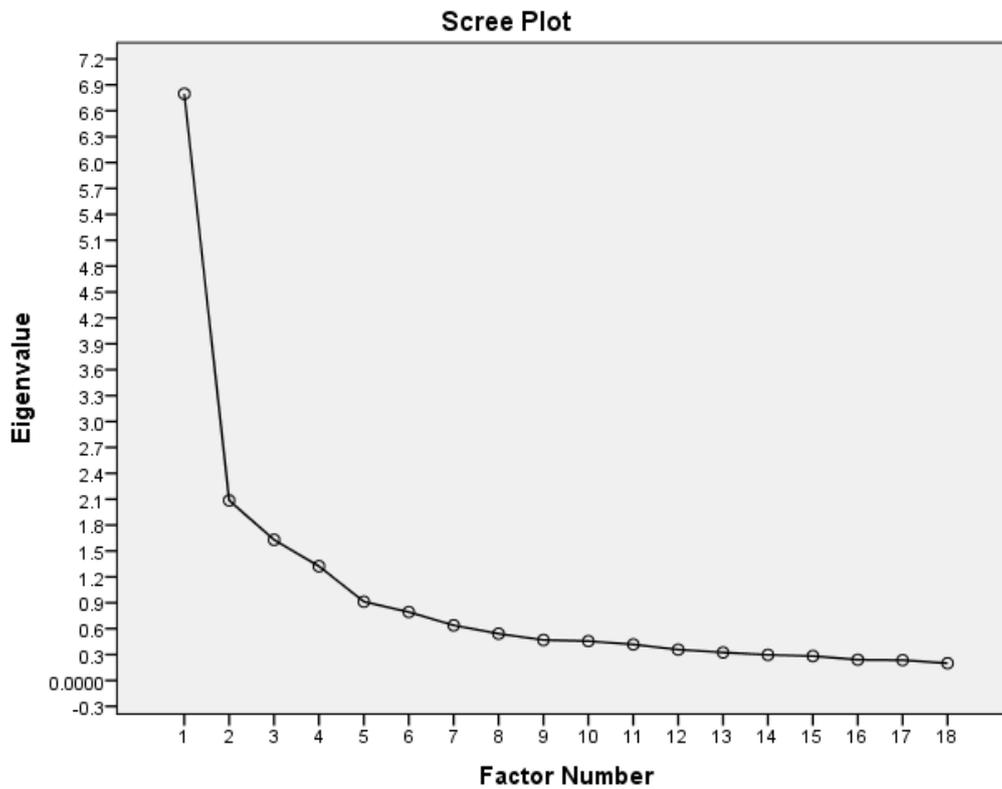
Figure. 1: Scree Plot

Table 2: Factor Loadings & Cronbach's Alpha value of the Academic Honesty Scale

Factor	Items	Loadings	Cronbach's Alpha value
Cheating During and After Exam	Item26	.886	0.876
	Item19	.782	
	Item7	.739	
	Item14	.711	
	Item17	.644	
	Item3	.626	
Cheating during Examination with Neighbor	Item22	.936	0.765
	Item6	.590	
	Item12	.556	
Falsification and Plagiarism	Item5	.866	0.847
	Item10	.714	
	Item18	.677	
	Item20	.644	
	Item24	.626	
	Item21	.561	
Cheating Prior to the Exam	Item16	.834	.808
	Item4	.793	
	Item9	.478	
Academic Honesty			.871

RELIABILITY ANALYSIS

According to McMillan (2007) the reliability of an instrument is concerned with the consistency, stability, and dependability of the scores. Cronbach's alpha coefficient indicates how well the items fit together conceptually (Nunally, 1994 and DeVon et al., 2007), with the acceptable value of $\geq$ 0.70 (DeVellis, 2012). The value of Cronbach Alpha is classified based on the reliability index classification where 0.90-1.00 is very high, 0.70-0.89 is high, 0.30-0.69 is moderate, and 0.00 to 0.30 is low (Babbie, 1992). Hence the internal consistency was tested using Cronbach's alpha for each factor and total in SPSS. Table 2 also shows that the Cronbach's Alpha value of the academic honesty scale and its dimensions which range from 0.765 to .876. The analysis shows that the obtained Cronbach Alpha values are higher than 0.70, which fall into the classification of high and very high. They clearly evince that the internal consistency of each factor of academic honesty scale are in the acceptable range of Cronbach's Alpha value.

FINDINGS AND EDUCATIONAL IMPLICATIONS OF THE STUDY

The findings of the present study using the Exploratory Factor Analysis (EFA) – Maximum Likelihood method of extraction with oblique rotation, indicate that four factors viz., Cheating during and after examination, cheating during the examination with neighboring candidate, Falsification and Plagiarism and Cheating prior to the examination explain the level of academic honesty of the B.Ed. trainees, which is need of the hour for promoting quality education. The calculated values of Cronbach's alpha coefficients reveal that the scales possess a very high level of reliability and construct validity. The Mean and Standard Deviation that will be obtained to measure the level of academic honesty level of the B.Ed. Trainees using this scale will definitely enable the policy makers to understand the characteristics of the B.Ed. trainees and decide or establish academic honesty policy in order to ensure quality education both at School education and Teacher Education.

CONCLUSION

This study offers a scale to measure B.Ed. trainees' academic honesty level. On the basis of the obtained results of Cronbach's alpha coefficients, it is concluded that the developed tool, has a very high level of reliability and construct validity. Therefore, the instrument could be used to assess / measure the level of academic honesty of B.Ed. Trainees which is the need of the hour for ensuring the development of an honest teacher at present and development of honest students (citizen) in future by B.Ed. trainees.

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