TESTING A CONSTRUCT VALIDITY AND RELIABILITY OF THE FACTORS AFFECTING ON THE EMPLOYEES' PERFORMANCE USING (EXPLORATORY & CONFIRMATORY)

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ABSTRACT

The current study aimed to test the construct validity of the model for measuring the Factors Affecting on the Employees' Performance. To achieve this aim, the researcher used Exploratory Factor Analysis (EFA) through the SPSS program Version 23 and Confirmatory Factor Analysis (CFA) Version 23. The study population represents the Employees in the Al-Zawiya University of Libya the findings of the study verified the construct validity of the model as a reliable scale.

Keywords: Factors Affecting, Employees' Performance, Exploratory Factor Analysis

INTRODUCTION

Many scientific studies are featured by the fact that "numerous variables are used to characterize objects" (Rietveld & Van Hout 1993: 251). Examples are studies in which questionnaires are used that consist of a lot of questions (variables), and studies in which mental ability is tested via several subtests, like verbal skills tests, logical reasoning ability tests, etcetera (Darlington 2004). Because of these big numbers of variables that are into play, the study can become rather complicated. Besides, it could well be that some of the variables measure different aspects of a same underlying variable. For situations such as these, (exploratory factor analysis has been invented Factor analysis attempts to bring intercorrelated variables together under more general, underlying variables. More specifically, the goal of factor analysis is to reduce "the dimensionality of the original space and to give an interpretation to the new space, spanned by a reduced number of new dimensions which are supposed to underlie the old ones" (Rietveld & Van Hout 1993: 254), or to explain the variance in the observed variables in terms of underlying latent factors" (Habing 2003: 2) Thus, factor analysis offers not only the possibility of gaining a clear view of the data but also the possibility of using the output in subsequent analyses (Field 2000; Rietveld & Van Hout 1993). In this paper, an example will be given of the use of factor analysis using program Version (23).

METHOD

Data Collection and Sampling Design

A questionnaire was used to acquire empirical data related to each of the study variables. The questionnaire was distributed to Employees in the Al-Zawiya University of Libya. Total of (500) questionnaires were distributed. (407) questionnaires were returned, of which (361) were valid, which represents 72.2% response rate. The data was collected over a period of time from (January to April 2016).

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Research Design

The present study used a quantitative research design, specifically the descriptive survey design. This is because such design accurately and objectively describes the characteristics of a situation or phenomenon being investigated in a given study. It provides a description of the variables in a particular situation and, sometimes, the relationship among these variables rather than focusing on the cause-and-effect relationships (Johnson & Christensen, 2012:366). Thus, this study used a questionnaire which was developed from previous research in order to measure the relationships among the investigated variables. As an approach to the easy collection of data, the survey used in this study encompasses five main Variables: Training, Empowerment, Motivation, Communication, and Employees' Performance, These Variables were adopted from the literature review of previous related research from these studies (Pimtong Tavitiyaman, 1996; Ronah, 2015; Chng, Hee & et al, 2014; Caroline Njambi, 2014; Yasir, 2011, & Neelam, Israr& et al. 2014).Thus, the entire survey used in this study comprises 24 items which had to be responded to by the respondents using a five- point's Likert scale: 1= strongly disagree to 5 = strongly agree. Before distributing the survey to the participants, it was translated into Arabic because the participants cannot read in English.

FINDINGS AND DISCUSSION

Reliability

Cronbach's alpha is a commonly used measure of the reliability of a set of two or more construct indicators. Reliability is a measure of internal consistency of the construct indicators (Streiner, 2003). According to Hair, et al. (2010), reliability refers to the extent to which a set of indicators measure an aggregate construct consistently, the alpha value of (0.60) is sufficient (Sekaran and Bougie, 2010). An internal consistency analysis was performed separately for the items under each of the criteria. The reliability coefficient (Cronbach's alpha) was calculated for each item above (0.60). The alpha values found for each variable indicated that each variable was a reliable measure.

EXPLORATORY FACTOR ANALYSIS

Result of the latent root criterion

The result of the latent root criterion and the scree plot indicated that five factors with an Eigen value of greater than 1 should be extracted from the items submitted for factor analysis.

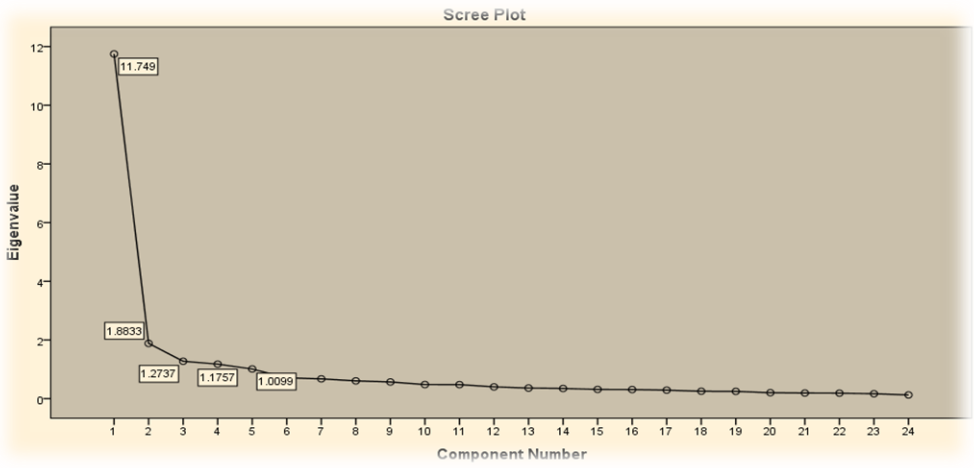

Figure 1. Scree Plot with five –factors- Eigen.

Correlation Matrix

The following table (2) shows Correlation Matrix Between the items ranged from (0.258, 0.759) with all Correlation were below 0.85 (Brown, 2006, P: 166).

Table 2. Correlation Matrix of Factors Affecting on the Employees' Performance

Items	1.1	1.2	1.3	1.4	1.6	1.7	1.8	1.9	2.1	2.3	2.4	2.5	2.7	3.2	3.3	3.4	3.5	3.7	3.8	4.1	4.2	4.3	4.5	4.6	5.2	5.3	5.4	5.5	5.6
1.1	1.000																												
1.2	.759	1.000																											
1.3	.553	.660	1.000																										
1.4	.487	.534	.673	1.000																									
1.6	.695	.796	.698	.557	1.000																								
1.7	.619	.699	.529	.507	.624	1.000																							
1.8	.561	.587	.577	.537	.586	.716	1.000																						
1.9	.528	.624	.511	.478	.586	.584	.482	1.000																					
2.1	.537	.514	.451	.426	.496	.539	.498	.458	1.000																				
2.3	.523	.479	.464	.393	.488	.492	.452	.384	.625	1.000																			
2.4	.456	.414	.438	.369	.386	.406	.453	.310	.538	.726	1.000																		
2.5	.491	.471	.404	.397	.429	.476	.460	.374	.510	.601	.627	1.000																	
2.7	.489	.499	.453	.466	.485	.642	.658	.403	.586	.584	.496	.492	1.000																
3.2	.476	.507	.443	.494	.452	.559	.455	.396	.539	.459	.372	.484	.576	1.000															
3.3	.467	.500	.443	.470	.493	.587	.473	.410	.536	.472	.429	.523	.518	.747	1.000														
3.4	.452	.495	.454	.479	.479	.506	.533	.466	.497	.443	.360	.473	.473	.556	.630	1.000													
3.5	.452	.464	.450	.427	.456	.440	.456	.360	.506	.429	.364	.446	.463	.667	.708	.733	1.000												
3.7	.369	.315	.326	.332	.281	.350	.259	.355	.358	.286	.225	.318	.315	.427	.409	.472	.414	1.000											
3.8	.493	.512	.535	.553	.517	.504	.418	.510	.517	.452	.415	.475	.445	.634	.665	.489	.526	.439	1.000										
4.1	.343	.351	.318	.319	.349	.366	.292	.359	.391	.317	.297	.374	.324	.369	.277	.315	.275	.264	.369	1.000									
4.2	.336	.380	.353	.375	.334	.372	.338	.354	.367	.317	.261	.328	.382	.368	.312	.351	.337	.240	.394	.646	1.000								
4.3	.303	.289	.340	.265	.328	.333	.258	.331	.355	.287	.205	.252	.294	.279	.277	.239	.219	.387	.344	.467	.405	1.000							
4.5	.415	.423	.345	.313	.367	.388	.325	.426	.417	.340	.320	.362	.349	.340	.266	.310	.274	.253	.380	.711	.703	.523	1.000						
4.6	.489	.478	.401	.419	.452	.486	.431	.475	.509	.411	.330	.456	.441	.442	.387	.435	.417	.340	.456	.470	.530	.426	.616	1.000					
5.2	.498	.477	.492	.498	.474	.470	.456	.391	.499	.527	.464	.523	.460	.424	.408	.411	.408	.300	.416	.383	.350	.363	.353	.467	1.000				
5.3	.539	.544	.515	.483	.529	.564	.475	.410	.522	.484	.394	.488	.496	.599	.519	.463	.482	.275	.504	.399	.433	.263	.393	.447	.595	1.000			
5.4	.467	.547	.460	.437	.503	.533	.442	.402	.506	.489	.461	.493	.510	.519	.520	.457	.437	.291	.457	.531	.471	.321	.412	.482	.595	.679	1.000		
5.5	.500	.517	.487	.440	.506	.425	.468	.412	.525	.486	.473	.473	.488	.453	.439	.530	.476	.294	.455	.365	.451	.248	.405	.471	.515	.595	.701	1.000	
5.6	.452	.511	.508	.470	.569	.480	.472	.448	.513	.457	.418	.437	.459	.469	.489	.497	.468	.245	.464	.395	.407	.358	.401	.456	.547	.603	.669	.721	1.000

CONFIRMATORY FACTOR ANALYSIS

The Modified Model

The fit of the measurement model was assessed using the following statistics and indices: Chi-square , the ratio of the Chi-square to the degrees of freedom (DF), Goodness-of-fit index (CFI), Root-mean-square residual and Root Mean Squared Error (RMSEA). Chi-square/df values less than or equals 3 indicates a good model fit, and between 2.0 and 5.0 is acceptable level (Hair, et al., 2010; Schumacker and Lomax, 2004). CFI values should be greater than 0.9 (Wang and Wang, 2012; Hair, et al., 2010). RMSEA values less than 0.10 indicate good fit (Devaraj, et al., 2002). The goodness of fit indices of the measurement model is presented in (table 3); according to these results we can infer that the measurement model was reasonably fitted to the data set.

Construct Validity and Reliability of the Training Model

The results of the goodness-of-fit of the final revised of the training model showed that normal chi- square (CMIN/DF) was (3.280) the CFI was (0.980) and RMSEA was (0.080). Figure (2) shows the adequacy of the final revised of the Training model.

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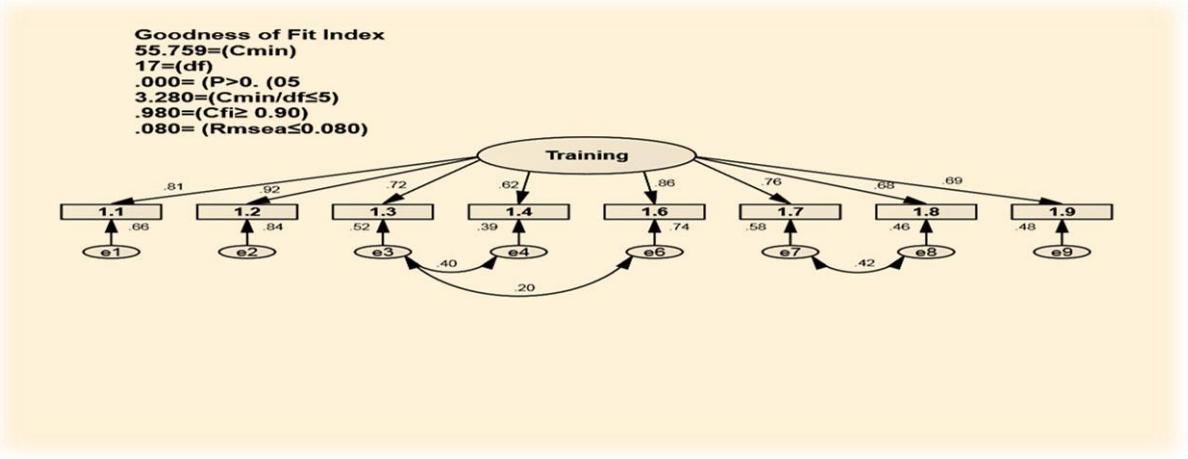

Figure 2. Construct Validity of the Training model with eight- items

In addition to, the lodging for the parameters variable ranged from 0.62 to 0.92, with all parameters was above 0.5 (≥0.5). The reliability was greater than 0.60 (≥0.60) Sekaran and Bougie, (2010), it ranged from 0.901 to 0.904. The AVE reading was 0.58 where the value was greater than 0.5 (≥0.5) Fornel and Larker (1981). Consequently, all results fulfilled the AVE, and the reliability discriminant validity of the model. In general, the measurement of the Training model was fit and fulfilled the construct as depicted in the table (3).

Table 3. Construct Validity and Reliability of the Training model

Items	*Reliability*	*Estimate*	*S. E.*	*C. R.*	*P*	*Loading*	*SMC*	*AVE*
1.1	0.923	0.9483	0.0450	21.0527	***	0.81	0.66	0.58
1.2	0.918	1.0000	-	-	-	0.92	0.84	-
1.3	0.921	0.8022	0.0475	16.8921	***	0.72	0.52	-
1.4	0.924	0.7015	0.0515	13.6103	***	0.62	0.39	-
1.6	0.919	0.9210	0.0390	23.6117	***	0.86	0.74	-
1.7	0.921	0.8196	0.0440	18.6400	***	0.76	0.58	-
1.8	0.923	0.7424	0.0483	15.3823	***	0.68	0.46	-
1.9	0.924	0.6695	0.0423	15.8181	***	0.69	0.48	-

***S.E**. Standard Error, **C.R**.: Critical Ratio, **P**: Probability, **SMC**: Squared Multiple Correlations. **AVE**: Average Variance Extracted*

Construct Validity and Reliability of the Empowerment Model

Figure (4) show us the model fit of the final revised of the Empowerment model was that normal chi- square (CMIN/DF) was (3.188) the CFI was too high (0.990) and RMSEA was (0.078). Figure (3) shows the adequacy of the final revised of the empowerment model.

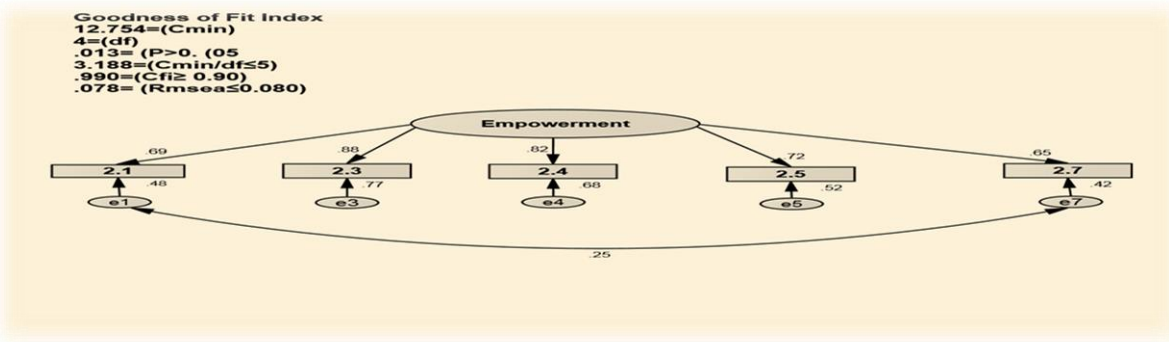

Figure 3. Construct Validity of the Empowerment model with five- Items

As seen by the results in Figure (4) and table (4) the lodging for the parameters variable ranged from 0.65 to 0.82, with all parameters was above 0.5 (≥0.5). The reliability was greater than 0.60 (≥0.60) Sekaran and Bougie, (2010), it ranged from 0.893 to 0.898. The AVE reading was 0.57 where the value was greater than 0.5 (≥0.5) Fornel and Larker (1981). Consequently, all results fulfilled the AVE, and the reliability discriminant validity of the model. In general, the measurement model of the Empowerment model was fit and fulfilled the construct as depicted in the table (4).

Table 4. Construct Validity and Reliability of the Empowerment Model

Items	*Reliability*	*Estimate*	*S. E.*	*C. R.*	*P*	*Loading*	*SMC*	*AVE*
2.1	0.893	0.8042	0.0560	14.3530	***	0.69	0.48	**0.57**
2.3	0. 893	1.0000	-	-	-	0.88	0.77	-
2.4	0.898	0.9558	0.0527	18.1223	***	0.82	0.68	-
2.5	0.895	0.8350	0.0548	15.2360	***	0.72	0.52	-
2.7	0.897	0.7305	0.0557	13.1198	***	0.65	0.42	-

S.E*. Standard Error,* ***C.R****.: Critical Ratio,* ***P****: Probability,* ***SMC****: Squared Multiple Correlations.*
AVE*: Average Variance Extracted*

Construct Validity and Reliability of the Motivation Model

The results of the goodness-of-fit of the final revised of the Motivation model showed that normal chi- square (CMIN/DF) was (2.952) the CFI was (0.989) and RMSEA was (0.074). Figure (3) shows the adequacy of the final revised of the Motivation model.

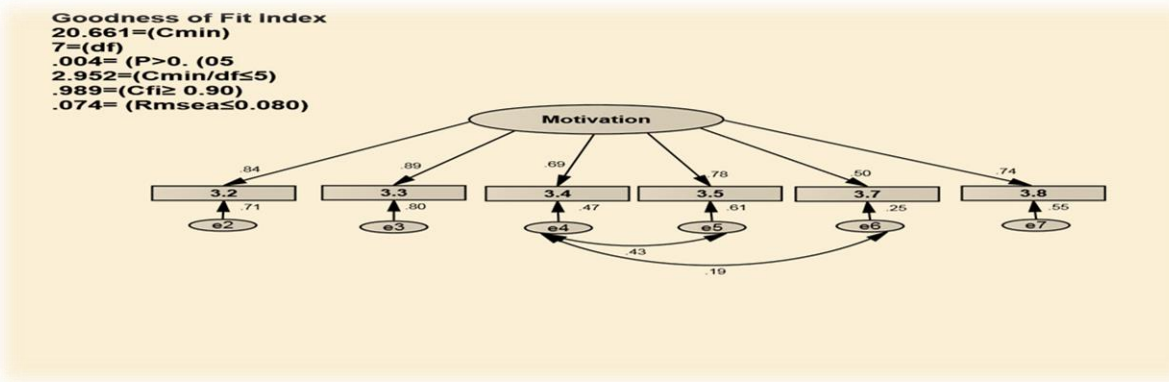

Figure 4. Construct Validity of the Motivation model with six- Items

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In the current study, the lodging for the parameters variable ranged from 0. 50 to 0.89, with all parameters were above 0.5 (≥0.5). And the reliability was greater than 0.60 (≥0.60), it ranged from 0.885 to 0.898. In addition, the AVE reading was 0.57 where the value was greater than 0.5 (≥0.5). Consequently, all results fulfilled the AVE, and the reliability discriminant validity of the model. In general, the measurement model of the Motivation model was fit and fulfilled the construct as depicted in Table (5).

Table 5. Construct Validity and Reliability of the Motivation Model

Items	*Reliability*	*Estimate*	*S. E.*	*C. R.*	*P*	*Loading*	*SMC*	*AVE*
3.2	0.880	0.9285	0.0455	20.3877	***	0.84	0.71	**0.57**
3.3	0.876	1.0000	-	-	-	0.89	0.80	-
3.4	0.879	0.7616	0.0514	14.8053	***	0.69	0.47	-
3.5	0.876	0.9037	0.0499	18.0956	***	0.78	0.61	-
3.7	0.898	0.5854	0.0590	9.9130	***	0.50	0.25	-
3.8	0.885	0.8179	0.0493	16.6025	***	0.74	0.55	-

S.E. *Standard Error,* ***C.R.****: Critical Ratio,* ***P****: Probability,* ***SMC****: Squared Multiple Correlations.*
AVE*: Average Variance Extracted*

Construct Validity and Reliability of the Communication Model

In this model, the goodness-of-fit of the final revised of the Communication was great, showed that normal chi- square (CMIN/DF) was (2.761) the CFI was (0.989) and RMSEA was (0.070). Figure (5) shows the adequacy of the final revised of the Communication model.

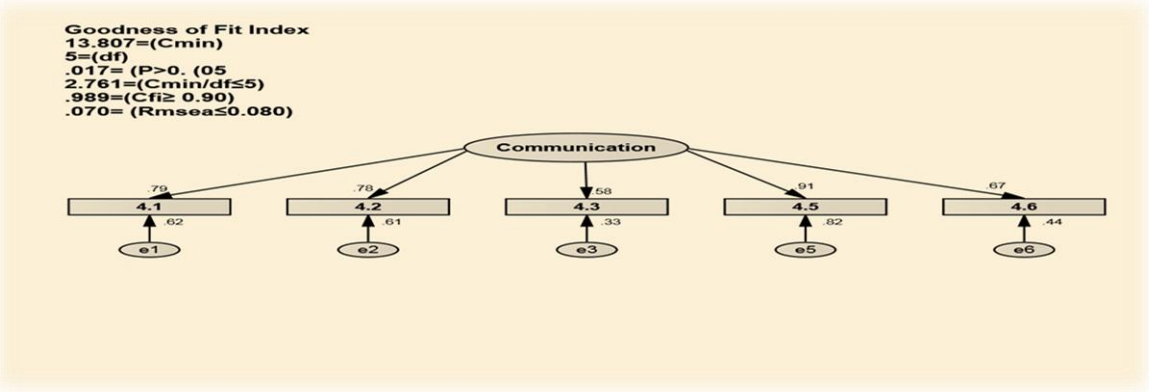

Figure 5. Construct Validity of the Communication model with five- Items

The lodging for the parameters variable ranged from 0.58 to 0.91, with all parameters was above 0.5 (≥0.5). The reliability was greater than 0.60 (≥0.60), it ranged from 0.850 to 0.886. In addition, the AVE reading was 0.56 where the value was greater than 0.5 (≥0.5). Consequently, all results fulfilled the AVE, and the reliability discriminant validity of the model. In general, the measurement model of the Communication model was fit and fulfilled the construct as depicted in Table (6).

Table 6. Construct Validity and Reliability of the Communication Model

Items	*Reliability*	*Estimate*	*S. E.*	*C. R.*	*P*	*Loading*	*SMC*	*AVE*
4.1	0.856	0.867	0.0479	18.0852	***	0.79	0.62	**0.56**
4.2	0.860	0.820	0.0457	17.9594	***	0.78	0.61	-
4.3	0.886	0.654	0.0559	11.6947	***	0.58	0.33	-
4.5	0.850	1.000	-	-	-	0.91	0.82	-
4.6	0.863	0.718	0.0506	14.2160	***	0.67	0.44	-

***S.E**. Standard Error, **C.R**.: Critical Ratio, **P**: Probability, **SMC**: Squared Multiple Correlations.*
***AVE**: Average Variance Extracted*

Construct Validity and Reliability of the Employees' Performance model:

In the present study, the goodness-of-fit of the final revised of the Employees' Performance model showed that normal chi- square (CMIN/DF) was (2.284) the CFI was (0.995) and RMSEA was (0.060). Figure (5) shows the adequacy of the final revised of the Employees' Performance.

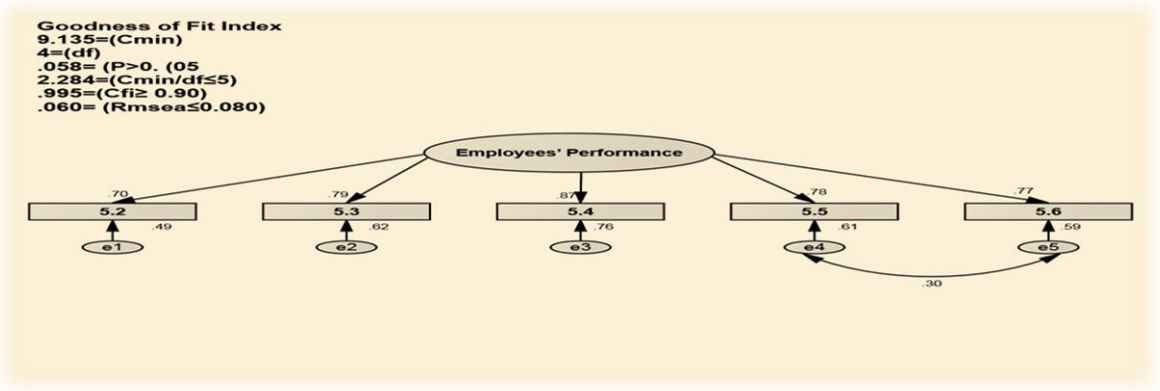

Figure 6. Construct Validity of the Employees' Performance model with five- Items

Beside construct validity and Reliability, the table (5) showed the lodging for the parameters variable ranged from 0.70 to 0.87, with all parameters were above 0.5 (≥0.5). The reliability was greater than 0.60 (≥0.60), it ranged from 0.891 to 0.896. In addition, the AVE readings were 0.61 where the value was greater than 0.5 (<0.5). In general, the measurement model of the Employees' Performance was fit and fulfilled the construct as depicted in Table (7).

Table 7. Construct Validity and Reliability of the Employees' Performance model

Items	Reliability	Estimate	S. E.	C. R.	P	Loading	SMC	AVE
5.2	0.891	0.8071	0.0549	14.6963	***	0.70	0.49	**0.61**
5.3	0.896	0.9186	0.0533	17.2484	***	0.79	0.62	-
5.4	0.893	1.0000	-	-	-	0.87	0.76	-
5.5	0.895	0.9342	0.0560	16.6692	***	0.78	0.61	-
5.6	0.893	0.9376	0.0573	16.3685	***	0.77	0.59	-

***S.E**. Standard Error, **C.R**.: Critical Ratio, **P**: Probability, **SMC**: Squared Multiple Correlations.*
***AVE**: Average Variance Extracted*

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CONCLUSION

This paper achieved the main goal of the study which was to Analysis Construct Validity and Reliability of the Factors Affecting on the Employees' Performance in the Al-Zawiya University of Libya through the use EFA and CFA as a means to structural equation modeling (SEM-AMOS). This was proposed and developed based on the identified measurement items of the main five factors (Training, Empowerment, Motivation, Communication, and Employees' Performance) in previous studies (Pimtong Tavitiyaman, 1996; Ronah, 2015; Chng, Hee & et al, 2014; Caroline Njambi, 2014; Yasir, 2011, & Neelam, Israr& et al. 2014). The results obtained in the present study especially regarding the validity of the measurement indicated the constructed model in its five factors are a reliable and valid measurement tool that can be used in measuring the (Factors Affecting on the Employees' Performance) . The model achieved the required convergent the reliability coefficient (Cronbach's alpha) was calculated for each item above (0.60). The alpha values found for each variable indicated that each variable was reliable measure validity or the AVE, among its five factors which even exceeded (0.50). A result that was in agreement or consistent with Fornell –Larcker (1981) Criterion.

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