Journal of Education and Educational Research
ISSN: 2957-9465 | Vol. 9, No. 3, 2024

Validity and Reliability Analysis of Innovation and Entrepreneurial Education, Self-Efficacy, and Employment Competitiveness Scales

Chun Chen *, Siti Maziha Mustapha

Infrastructure University Kuala Lumpur, Malaysia

* **Corresponding author**: Chun Chen (Email: chenchun2022@outlook.com)

Abstract: In the pilot study, it is necessary to assess the reliability and validity of all the scales and conduct Exploratory Factor Analysis. This study involves three scales. A total of 156 survey questionnaires were distributed in the pilot study, resulting in 150 valid responses. SPSS 26.0 was employed for data analysis. Based on the analysis results, certain items in the scales were removed. In the innovation and entrepreneurship education scale, two items were removed due to communalities values below 0.5. In the self-efficacy scale, one item supporting a dimension was removed. In the employment competitiveness scale, one item with communalities values below 0.6 was removed. After deleting some items through data analysis, the final Exploratory Factor Analysis (EFA) scales were obtained. The final scales will be used for field study based on the results obtained.

Keywords: Reliability; Validity; Exploratory Factor Analysis; Field Study.

1. Introduction

The pilot study for this research was conducted in August 2023. Researchers informed respondents about the purpose and requirements of the pilot study survey. Before filling out the survey questionnaire, respondents were asked to provide their opinions and reactions regarding their willingness to participate in the study. If they were willing to participate, they could proceed to answer the survey on Survey Star. Due to the maturity and widespread use of the three scales in this study, each scale was explained in detail in the survey questionnaire to guide respondents on how to fill it out. Therefore, respondents encountered no difficulties while completing the questionnaire, and no items needed to be altered due to comprehension issues.

A total of 156 pilot questionnaires were distributed to respondents using the Survey Star software, and all were collected. After examining the collected questionnaires, 150 questionnaires were deemed valid. In the pilot study, the response rate was 96.2%, which was deemed sufficient for researchers to proceed with the pilot study analysis. Prior to conducting the field study, reliability analysis and exploratory factor analysis (EFA) were performed on the survey questionnaire data from the 150 respondents.

2. Reliability Analysis

In this study, the 150 respondents were considered sufficient to test the reliability of the instruments. Using the method described, the reliability of each dimension and the overall reliability of the factors influencing the questionnaire were calculated. The results, as shown in Table 1, indicated that the total reliability value for all 56 items in this preliminary research was 0.931, while the reliability values for Innovation and Entrepreneurial Education, Self-efficacy, and Employment Competitiveness were 0.921, 0.840, and 0.822, respectively. These data demonstrate that these three questionnaires are reliable. The reliability values for each dimension of this questionnaire survey were above 0.8, indicating high stability and a certain degree of credibility.

Since this pilot study used the three main indicators mentioned earlier to remove items, it is also necessary to conduct reliability analysis for each item based on the dimensions of the scale.

Table 1. Reliability Analysis of Pilot Data (n = 150)

Variable	Cronbach's Alpha	No. of Items	Total
Innovation and Entrepreneurial Education	0.921	14	0.931
Self-efficacy	0.840	17	
Employment Competitiveness	0.822	25	

3. Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) is a method used to study and explore the relationships between observed variables without making any assumptions. It seeks to uncover the common structure or factors underlying the observed variables and assesses how each observed variable loads on these factors. EFA is employed to investigate the underlying structure of the data, assess the unidimensionality of theoretical constructs, and reduce the number of variables (Pett et al., 2003; Thompson, 2004).

In this study, EFA was applied during the pilot study. Specifically, EFA was conducted on all collected data with three main objectives: (a) determining the structure among constructs (Williams et al., 2010), (b) examining and assessing the unidimensionality of theoretical constructs, and (c) reducing the number of variables (Pett et al., 2003; Thompson, 2004). Therefore, EFA was identified as the most appropriate method to thoroughly investigate the items used to measure Innovation and Entrepreneurial Education, Self-efficacy, and Employment Competitiveness.

In this study, EFA was conducted on the pilot study to determine the underlying factor structure of how undergraduates from local universities in Jilin Province. A

total of 150 questionnaires were analyzed using IBM-SPSS 26.0, which met the minimum sample size requirement for EFA.

3.1. Exploratory Factor Analysis for Innovation and Entrepreneurial Education

Table 2. KMO and Bartlett's Test of Innovation and Entrepreneurial Education

KMO and Bartlett test		
KMO		0.891
Bartlett test	Approx. Chi-Square	2183.050
	df	66
	p value	0.000

In this study, 14 items were used to assess the structure of Innovation and Entrepreneurial Education (IEE). As shown in Table 2, for Innovation and Entrepreneurial Education, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.891 (Chi-Square = 2183.050, p-value = 0.000). This value exceeded the threshold of 0.6 (Hair et al., 2018). The Bartlett's Test of Sphericity also yielded a significant result, with a KMO value close to 1.0 and a significant p-value of 0.0. Furthermore, it was evident from the correlation matrix that many of the items measuring Innovation and Entrepreneurial Education had coefficients of 0.3 or greater.

Based on Principal Component Analysis (PCA) with varimax rotation, Table 3 presents the results for the 14 items under Innovation and Entrepreneurial Education (IEE). As a result of the PCA procedure, two principal components were extracted, and all component eigenvalues exceeded 1.0. The eigenvalue for the first principal component was 6.764, explaining a variance proportion of 56.364% of the original variables, while the eigenvalue for the second principal component was 3.089, explaining a variance proportion of 25.742%. The total variance explained was 82.106%, which exceeds the minimum acceptable percentage of variance explained in factor analysis (usually set at 60%). These results indicate that the factor analysis effectively explained the variance, with two factors accounting for 82.106% of the variance. Factor 1 contributed 56.364%, while Factor 2 contributed 25.742%.

Table 3. Total Variance Explained for Innovation and Entrepreneurial Education

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.764	56.364	56.364	6.764	56.364	56.364	6.448	53.733	53.733
2	3.089	25.742	82.107	3.089	25.742	82.107	3.405	28.374	82.107

As shown in Figure 1, the scree plot for the Innovation and Entrepreneurial Education variable divided the 14 items into two sections. A break in the plot was observed after the second factor.

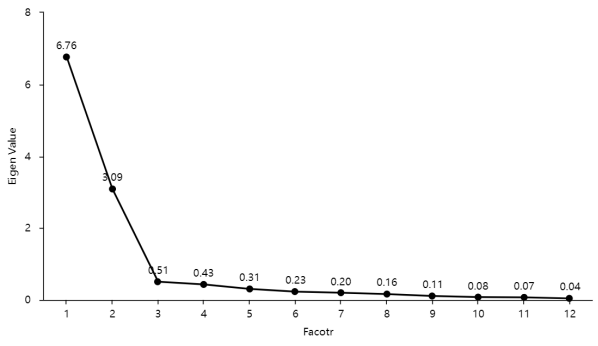


Figure 1. Scree Plot of Innovation and Entrepreneurial Education

As stated earlier, the use of parallel analysis was to provide further evidence in deciding the number of factors to be retained more easily. In agreement with the scree plot, the parallel analysis accepted a two-factor component. The parallel analysis confirms the acceptance of a two-factor for Innovation and Entrepreneurial Education construct.

Based on the rotated component matrix results of the Principal Component Analysis with varimax rotation for the Innovation and Entrepreneurial Education structure (Table 4), all 14 items had factor loadings greater than 0.6, except for IEE9 and IEE11. Therefore, IEE9 and IEE11 did not pass the reliability test. Consequently, items IEE9 and IEE11 were removed, leaving the remaining items fully aligned with the substructure of Innovation and Entrepreneurial Education.

Table 4. Overall dimension rotation component matrix

Items	Factor Loadings									Communalities
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	
IEE1	0.873	0.032	-0.026	-0.032	-0.036	0.014	-0.021	0.005	-0.078	0.773
IEE2	0.918	0.055	-0.012	-0.019	0.036	0.006	-0.028	0.028	-0.012	0.849
IEE3	0.102	0.921	0.034	-0.046	0.001	0.018	-0.029	-0.066	-0.024	0.868
IEE4	0.067	0.932	-0.067	0.003	0.012	-0.041	-0.058	0.014	0.068	0.887
IEE5	0.112	0.838	-0.034	0.035	0.086	-0.003	-0.058	-0.108	-0.005	0.740
IEE6	0.156	0.771	0.081	-0.017	0.077	-0.044	-0.015	0.019	-0.136	0.653
IEE7	0.909	0.112	0.047	0.015	0.073	0.005	-0.073	0.063	-0.021	0.857
IEE8	0.110	0.929	-0.013	-0.029	0.015	-0.022	-0.089	-0.052	0.062	0.892
IEE9	0.139	0.076	0.032	-0.057	0.109	0.058	-0.031	-0.032	0.096	0.316
IEE10	0.898	0.125	-0.018	-0.023	-0.018	0.019	-0.076	-0.018	-0.061	0.833
IEE11	0.135	0.053	0.067	-0.023	0.045	0.023	-0.033	0.000	0.055	0.216
IEE12	0.080	0.936	-0.022	0.008	-0.006	-0.015	-0.085	-0.029	0.057	0.894
IEE13	0.103	0.883	0.130	-0.104	0.082	-0.071	-0.058	-0.090	-0.036	0.842
IEE14	0.101	0.893	0.081	-0.130	0.081	-0.088	-0.050	-0.049	-0.008	0.851

The EFA results for Innovation and Entrepreneurial Education, consisting of 14 items, revealed two dimensions: After removing the non-conforming items IEE9 and IEE11, Personal Factors (PF) which include items IEE1, IEE2, IEE7, IEE10, and University Factors (UF) which include items IEE3, IEE4, IEE5, IEE6, IEE8, IEE12, IEE13, IEE14.

3.2. Exploratory Factor Analysis for Self-efficacy

In this study, 17 items were used to assess the structure of self-efficacy (SE). Initially, self-efficacy was measured along

three dimensions: (a) active behavioral willingness (ABW), (b) willing to put in effort to complete the behavior (WPECB), (c) persistence in the face of adversity (PFA). As shown in Table 5, it was found that the pilot data with N = 150 is suitable for factor analysis. For self-Efficacy, the KMO is 0.871 (Chi-Square =2786.921, p-value = 0.000), which exceeds the threshold of 0.6 (Hair et al., 2018). The Bartlett's Test of Sphericity also yielded significant results, and the KMO value is close to 1.0, with a significant value of 0.0, indicating that the data is suitable for factor analysis. Additionally, it is evident from the correlation matrix that many of the items measuring self-efficacy have coefficients of 0.3 or greater.

Table 5. KMO and Bartlett's Test of Self-efficacy

KMO and Bartlett test		
KMO		0.871
Bartlett test	Approx. Chi-Square	2786.921
	df	136
	p value	0.000

Based on the Principal Component Analysis with Varimax Rotation, Table 6 displays the results of the 17 items of self-efficacy. Therefore, the mediating variable is divided into four dimensions.

Table 6. Total Variance Explained for Self-efficacy

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.946	34.975	34.975	5.946	34.975	34.975	5.889	34.639	34.639
2	4.095	24.089	59.063	4.095	24.089	59.063	4.108	24.164	58.803
3	3.402	20.010	79.073	3.402	20.010	79.073	3.435	20.204	79.007
4	1.001	5.889	84.962	1.001	5.889	84.962	1.012	5.955	84.962

Based on the rotated component matrix results from the Principal Component Analysis with Varimax Rotation for self-efficacy, as shown in Table 6, the 17 items have been divided into four factors: Factor 1 comprises items 6-12. Factor 2 comprises items 1-5. Factor 3 comprises items 14-17. Factor 4 only comprises item 13.

After the Principal Component Analysis with Varimax Rotation, it was found that Factor 4 has an eigenvalue of 1.004, explaining 5.904% of the variance in the original variables, which is relatively low. Therefore, item SE13 has been removed from the analysis. The remaining items are categorized into three dimensions, which align well with the substructure of self-efficacy.

After removing item SE13 from the analysis, a further analysis was conducted. a total of 16 items were used to assess the structure of self-efficacy. As shown in Table 7, it was found that the pilot data with N = 150 is suitable for factor analysis. For self-efficacy, the KMO is 0.710 (Chi-Square =27742.230, p-value = 0.000), which exceeds the threshold of 0.6 (Hair et al., 2018).

Table 7. KMO and Bartlett's Test of Self-efficacy

KMO and Bartlett test		
KMO		0.710
Bartlett test	Approx. Chi-Square	27742.230
	df	1540
	p value	0.000

A Principal Component Analysis with Varimax Rotation was conducted once again on the remaining 16 items related to self-efficacy. Table 8 presents the results; the mediating variable was now divided into three dimensions. In agreement with the scree plot, the parallel analysis accepted a three-factor component. From Table 8, the eigenvalue of the first factor in the actual data is 5.947, and the eigenvalue of the second factor in the actual data is 4.099, the eigenvalue of the third factor in the actual data is 3.379, the eigenvalues of these three factors are much larger than those in the simulated data.

Table 8. Total Variance Explained for Self-efficacy

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.947	37.166	37.166	5.947	37.166	37.166	5.893	36.834	36.834
2	4.099	25.620	62.787	4.099	25.620	62.787	4.100	25.625	62.459
3	3.379	21.118	83.905	3.379	21.118	83.905	3.431	21.445	83.905

As shown in Figure 2, a scree plot for the self-efficacy variable was generated. An interesting observation is that a break or discontinuity was observed on the scree plot after the third factor. As the values in the simulative data are lower than the actual data, the parallel analysis confirms the acceptance of a three-factor for self-efficacy construct. The fourth factor is rejected since the eigenvalue of the fourth factor (0.46) in the actual data set is lower than the simulative data.

Based on the varimax rotated component matrix results for the self-efficacy structure after the Principal Component Analysis (PCA), shown in Table 9, all 16 items had factor loadings greater than 0.7. Therefore, SE13 did not pass the reliability test, and it was removed. The remaining items fully conform to the substructure of self-efficacy.

The EFA results indicate that the self-efficacy scale consisting of 16 items can be divided into three dimensions, namely:(a) active behavioral willingness (ABW), comprising items SE1 to SE5, totaling 5 items. (b) willing to put in effort to complete the behavior (WPECB), comprising items SE6 to SE12, totaling 7 items. (c) persistence in the face of adversity (PFA), comprising items SE14 to SE17, totaling 4 items.

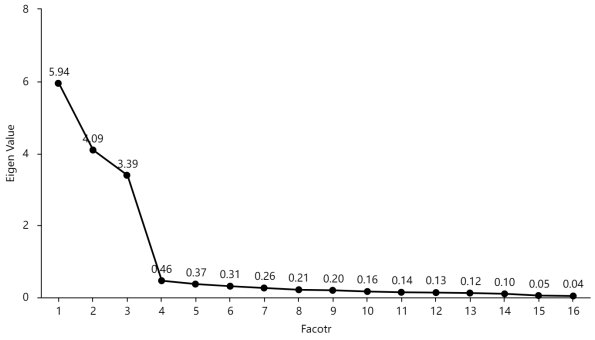


Figure 2. Scree Plot of Self-efficacy

Table 9. Overall dimension rotation component matrix

Items	Factor Loadings									Communalities
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	
SE1	0.872	0.052	-0.016	-0.041	-0.047	0.011	-0.026	-0.002	-0.064	0.773
SE2	0.916	0.073	-0.003	-0.027	0.026	0.004	-0.032	0.022	0.000	0.847
SE3	0.909	0.121	0.052	0.010	0.067	0.004	-0.075	0.060	-0.015	0.858
SE4	0.880	0.086	0.041	-0.065	0.103	0.052	-0.042	-0.033	0.110	0.817
SE5	0.898	0.125	-0.018	-0.023	-0.018	0.019	-0.076	-0.018	-0.061	0.833
SE6	0.018	0.017	0.952	0.042	-0.019	-0.043	-0.078	0.047	0.010	0.919
SE7	-0.044	0.037	0.882	0.012	0.088	-0.135	0.000	-0.063	0.045	0.813
SE8	-0.031	-0.006	0.890	-0.012	0.103	-0.138	-0.041	-0.084	0.054	0.834
SE9	0.021	-0.000	0.864	-0.005	0.007	0.006	-0.049	0.150	-0.022	0.773
SE10	0.025	0.058	0.928	0.016	-0.043	-0.075	-0.019	0.063	0.038	0.878
SE11	0.044	0.043	0.925	0.059	-0.003	-0.069	-0.017	-0.024	0.054	0.871
SE12	0.090	0.023	0.930	0.052	-0.036	-0.090	-0.084	0.073	0.012	0.899
SE14	0.028	-0.010	0.071	0.082	0.009	0.004	-0.069	0.909	0.040	0.846
SE15	0.037	-0.163	0.046	-0.017	0.015	0.003	-0.059	0.901	-0.082	0.852
SE16	-0.006	-0.034	0.008	0.083	0.020	-0.047	0.018	0.924	0.046	0.868
SE17	0.001	-0.109	0.019	0.090	0.036	-0.037	-0.018	0.912	-0.079	0.861

3.3. Exploratory Factor Analysis for Employment Competitiveness

In this study, the structure of employment competitiveness (EC) was assessed using 25 items. Employment competitiveness was measured across four dimensions: (a) Subject Comprehension (SC); (b) Skills; (c) Personal Qualities (PQ); and (d) Metacognition.

As shown in Table 10, the KMO value for EC was 0.867 (Chi-Square = 3888.119, p-value = 0.000). This value exceeded the threshold of 0.6 (Hair et al., 2018). The Bartlett's Test of Sphericity also yielded significant results. Furthermore, it was evident from the correlation matrix that many of the items measuring employability had coefficients of 0.3 or greater.

Table 10. KMO and Bartlett's Test of Employment Competitiveness

KMO and Bartlett test		
KMO		0.867
Bartlett test	Approx. Chi-Square	3888.119
	df	276
	p value	0.000

Based on the Principal Component Analysis (PCA) with varimax rotation, Table 11 presents the results for the 25 items measuring employment competitiveness. The PCA procedure resulted in the extraction of four main components, The eigenvalues and the proportion of variance explained for each component are as follows: The first principal component had an eigenvalue of 6.083, explaining 25.347% of the variance in the original variables. The second principal component had an eigenvalue of 4.866, explaining 20.275% of the variance. The third principal component had an eigenvalue of 4.530, explaining 18.877% of the variance. The fourth principal component had an eigenvalue of 3.853, explaining 16.053% of the variance. In total, these four components explained 80.552% of the variance, exceeding the minimum acceptable percentage of 60% for effective factor analysis.

Table 11. Total Variance Explained for Employment Competitiveness

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.083	25.347	25.347	6.083	25.347	25.347	5.845	24.354	24.354
2	4.866	20.275	45.622	4.866	20.275	45.622	4.924	20.516	44.870
3	4.530	18.877	64.499	4.530	18.877	64.499	4.354	18.142	63.012
4	3.853	16.053	80.551	3.853	16.053	80.551	4.210	17.540	80.551

The scree plot for employment competitiveness variables, as shown in Figure 3, divides the 25 items into four distinct sections. After the fourth factor, a break was observed on the scree plot for employment competitiveness.

As stated earlier, the use of parallel analysis was to provide further evidence in deciding the number of factors to be retained more easily. In agreement with the scree plot, the parallel analysis accepted a four-factor component.

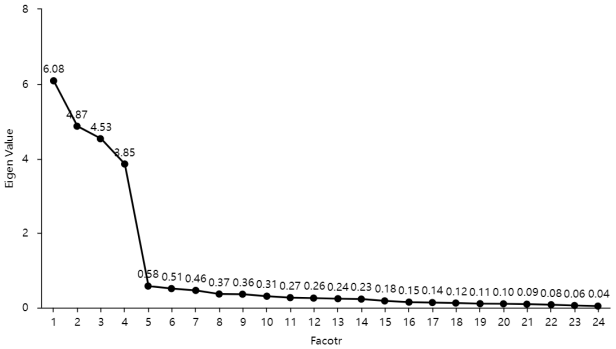


Figure 3. Scree Plot of Employment Competitiveness

Based on the varimax-rotated component matrix of the principal component analysis conducted on the employment competitiveness structure, as shown in Table 12, all 25 items had factor loadings greater than 0.6, except for EC12. Consequently, EC12 did not pass the reliability test, and it was removed. The remaining items fully comply with the substructure of employment competitiveness.

Table 12. Overall dimension rotation component matrix

Items	Factor Loadings									Communalities
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	
EC1	-0.106	-0.109	-0.073	0.008	-0.001	-0.011	0.891	0.055	-0.045	0.827
EC2	-0.118	-0.098	-0.023	0.009	-0.011	0.092	0.890	-0.042	0.021	0.826
EC3	-0.078	-0.100	-0.057	-0.013	-0.016	-0.011	0.926	-0.009	-0.001	0.877
EC4	-0.066	-0.077	-0.048	-0.012	-0.016	0.099	0.910	-0.068	-0.033	0.856
EC5	-0.049	-0.007	-0.060	-0.019	0.028	0.033	0.896	-0.066	0.006	0.815
EC6	0.040	-0.041	-0.089	-0.002	0.001	0.898	0.033	-0.034	-0.054	0.823
EC7	-0.003	-0.087	0.055	-0.058	-0.041	0.841	-0.012	0.052	-0.011	0.726
EC8	0.077	-0.117	-0.086	-0.095	-0.012	0.743	0.041	-0.011	0.111	0.602
EC9	0.020	0.029	-0.057	-0.055	0.000	0.831	0.075	-0.005	0.110	0.716
EC10	-0.034	0.052	-0.172	-0.037	-0.022	0.834	0.022	-0.078	-0.057	0.740
EC11	0.078	-0.062	-0.163	-0.025	0.014	0.886	0.035	-0.008	-0.052	0.826
EC12	0.015	-0.053	0.118	0.066	0.061	-0.082	0.126	0.016	0.732	0.584
EC13	-0.049	-0.049	-0.003	0.924	-0.000	-0.041	0.034	0.043	-0.076	0.869
EC14	-0.059	-0.031	0.070	0.919	0.068	-0.060	0.049	0.064	0.026	0.869
EC15	-0.054	-0.084	0.031	0.884	-0.025	-0.058	0.003	-0.010	0.067	0.801
EC16	-0.009	0.020	0.034	0.925	0.015	-0.069	0.043	0.036	-0.010	0.865
EC17	-0.019	0.003	0.016	0.868	0.037	-0.071	-0.087	0.044	0.060	0.773
EC18	-0.027	-0.050	0.015	0.929	0.033	0.016	-0.031	0.037	0.053	0.873
EC19	-0.031	-0.059	-0.001	0.913	0.030	-0.011	-0.038	0.049	0.037	0.844
EC20	0.039	0.092	-0.003	-0.012	0.923	0.024	-0.005	-0.013	-0.036	0.864
EC21	0.048	0.031	0.070	0.053	0.899	-0.053	-0.049	0.047	-0.027	0.827
EC22	0.024	0.021	0.067	0.020	0.891	-0.040	-0.059	0.044	0.013	0.807
EC23	0.021	0.056	-0.043	0.076	0.848	0.046	0.093	0.032	0.046	0.744
EC24	0.061	0.061	-0.005	0.005	0.923	-0.007	0.013	-0.036	-0.066	0.866
EC25	0.072	0.048	0.002	0.006	0.920	-0.035	-0.006	0.008	0.040	0.857

The EFA results indicate that the employment competitiveness scale consisting of 25 items (as shown in Table 12) can be divided into four dimensions, namely:(a) Subject Comprehension (SC), comprising items EC1 to EC5, totaling 5 items. (b) Skills, comprising items EC6 to EC11, totaling 6 items. (c) Personal Qualities (PQ), comprising items EC13 to EC19, totaling 7 items. (d) Metacognition, comprising items EC20 to EC25, totaling 6 items.

4. Conclusion

The preliminary research questionnaire (Appendix A) consisted of a total of 68 items, divided into four parts as follows: Part A: Basic Information (12 items); Part B: Innovation and Entrepreneurial Education (14 items); Part C: Self-efficacy (17 items); Part D: Employment Competitiveness of Undergraduates (25 items). After conducting exploratory factor analysis (EFA) for the three instruments in this study, the following items were removed: No items were removed from Part A (PASS). Two items were removed from Part B (IEE).One item was removed from Part C (SE).One item was removed from Part D (EC). As a result, the final questionnaire used in the field study, as presented in Appendix A, consisted of a total of 64 items, with 12 items in Part A, 12 items in Part B, 16 items in Part C, and 24 items in Part D.

Table 13. Scale Overview with Excluded Items

Instrument	Before pliot	After pliot	Items removed
Basic Information	12	12	None was removed
Innovation and Entrepreneurial Education	14	12	IEE9 and IEE11 were removed
Self-efficacy	17	16	SE13 was removed
Employment Competitiveness	25	24	EC12 was removed

References

[1] Hair, J. F., Black, W. C., Babin, B., & Anderson, R. E. (2018). Multivariate data analysis. Cengage.

[2] Jing, L., (2010). Research on Entrepreneurship Education for College Students Based on Entrepreneurial Self-efficacy. Economic Forum, (10), 54-56.

[3] Pett, M. A., Lackey, N. R., & Sullivan, J. J. (2003). Making sense of factor analysis: The use of factor analysis for instrument development in health care research. sage.

[4] Thompson, B. (2004). Exploratory and confirmatory factor analysis: Understanding concepts and applications. Washington, DC, 10694.

[5] Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. Australasian journal of paramedicine, 8(3).